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Reports of
The Princeton University Expeditions to Patagonia, 1896-1899

J. B. HATCHER in Charge

EDITED BY
WILLIAM B. SCOTT
BLAIR PROFESSOR OF GEOLOGY AND PALÆONTOLOGY, PRINCETON UNIVERSITY

VOLUME VIII—BOTANY

PART I—THE VEGETATION OF WESTERN PATAGONIA
By PER DUSÉN

PART II—HEPATICÆ
By ARTHUR W. EVANS
YALE UNIVERSITY

PART III—BRYOPHYTA
By PER DUSÉN

PART IV—PTERIDOPHYTA
By GEORGE MACLOSKIE
PRINCETON UNIVERSITY

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I. THE VEGETATION OF WESTERN PATAGONIA

BY P. DUSÉN

II. HEPATICÆ COLLECTED IN SOUTHERN PATAGONIA

BY A. W. EVANS
YALE UNIVERSITY

III. PATAGONIAN AND FUEGIAN MOSSES

BY P. DUSÉN

IV. FERNS AND FERN-LIKE PLANTS OF PATAGONIA

V. FLORA PATAGONICA (IN PART)

BY GEORGE MACLOSKIE
PRINCETON UNIVERSITY

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Pp. 595–810. Pll. XXI–XXVII, published Nov. 25, 1905.
Pp. 811–982. Pll. XXVIII–XXXI, published Feb. 28, 1906.

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PRINCETON UNIVERSITY,
PRINCETON, N. J., November, 1905.

TO PROFESSOR W. B. SCOTT,

Dear Sir:

Having been requested by you to take charge of the collections of Patagonian plants made by the late Mr. John B. Hatcher and Mr. O. A. Peterson, I have the honor to submit this volume as the outcome of such measures as I was able to adopt. It consists of: (1) a general sketch of the vegetation of Western Patagonia, hitherto little known, which was prepared for me by Dr. Per Dusén, one of the leading explorers of that section, and an expert in its botany; (2) the Hepaticæ, or Liverworts, having been worked up by Professor Alexander W. Evans, of Yale University, and reported on with descriptions and illustrations of new species, in the *Torrey Bulletin* of August, 1898, here reproduced with the permission of the author and the publishers; (3) Dr. Dusén, who is a specialist in Bryology, and an authority on the Mosses of Peraustral America, has prepared for us a report on the Hatcher Mosses, with descriptions and illustrations of the new species. This forms Part III, and is partially simultaneous with the publication by the same author in the Swedish Reports, describing the large collections of Mosses made by himself and others in connection with the Nordenskjöld Swedish Exploration in Southern and Western Patagonia.

My own share of the work has consisted chiefly in examining and describing the Pteridophytes and the Flowering-plants of the Hatcher-Peterson collections, and also of a small collection by Mr. Barnum Brown, entrusted to me by Director N. L. Britton, of the New York Botanical Garden. Though there was not much new material in any of these collections, they proved to be valuable, as illustrating a very interesting and instructive flora, with which northern botanists are not usually familiar. In these circumstances it was judged desirable, with your concurrence, to prepare a general summary of the species, with as much descriptive matter as might enable one provisionally to identify them; also with some notes of their habitats and of their relations to plants in extern lands. (In a very few cases descriptions of noteworthy extern species are given for purposes of comparison.) The task proved more formidable than I had anticipated; and I cannot say that I have always succeeded as well as I might have done. My aim was to provide a book which shall be helpful to others in circumstances like my own; and to furnish a sketch of a peculiar and interesting vegetation.

The region which the work embraces has for a long time been fascinating to botanists, and now colonists from various parts of Europe are feeling their way into it, giving promise to transform it in the near future into a field of agricultural and commercial development. It may therefore be convenient to have in a single volume the information regarding its peculiar plants, which is now spread over learned volumes and papers in several languages.

I have to make large acknowledgments of aid rendered me by others. Professor B. L. Robinson, Director of the Gray Herbarium, of Harvard University, and Director N. L. Britton, of the New York Botanical Garden, gave me personal help and the free use of the splendid libraries and botanical collections under their care; and Miss Mary Anne Day, of the Gray Herbarium, and Miss Anna Murray Vail, of the Library of the New York Botanical Garden, duplicated the favor by their skilful and unwearied services in piloting me through the books and collections. Professors J. K. Small and P. A. Rydberg, of the New York Botanical Garden, assisted me with their experience. I have also to thank Mr. W. J. Fox and Mr. Sanderson Brown, of the Library of the Academy of Sciences, Philadelphia; Director F. V. Coville of the U. S. Agricultural Department, Washington, D. C., and Professor E. L. Greene, lately Professor of Botany in the Catholic University of that city; also Professor E. L. Morris, of Washington High Schools, and Professor H. C. Thompson, of the Botanic Garden of St. Louis. Professor Lucien M. Underwood, of Columbia University, New York, examined and named the ferns for me; and Professor Francis E. Lloyd, of the same place, examined the Lycopodiums, and aided me in other ways. One of the last services rendered on his favorite *Chara* by the lamented T. F. Allen, of New York, appears on page 126.

Foreign correspondents have also been generous. Dusén crowned his services, noted above, by sending me numerous publications, issued by the Swedish Society, with lists of Patagonian and Fuegian plants collected, and many of them described by himself. Dr. Carlos Spegazzini, of La Plata, by far the most industrious and apt of living authorities on the Per-austral Vegetation of Argentina, Eastern Patagonia and Fuegia, furnished me with his valuable publications, and sometimes with his advice. Dr. F. Kurtz, of the Museum of Cordoba, Argentina, sent me a set of the botanical publications of that institution. And I have the honor to acknowledge assistance, for identifications and otherwise, received from Sir W. T. Thiselton Dyer, of the Royal Botanical Garden of Kew, and from Dr. O. Hoffmann and Dr. E. Gilg, of the Königlich Botanischer Garten of Berlin. Dr. Hoffmann is entitled to thanks for Plate XXX, which illustrates new species of Compositæ, described by himself from specimens collected by Dusén; one of them by Hatcher. Dr. Gilg describes an interesting new species of *Draba* which is in the Hatcher collection.

Whilst some of the plates represent new species, others present long known forms chosen as types of the very curious vegetation of the country. I am under obligations to the artist, Mr. J. Nugent Fitch, a nephew and worthy successor of the artist of the *Flora Antarctica.* He has shown marvellous skill in his work; often having had very poor material to work from. Mr. F. Van Iterson prepared the sketches, under my supervision; and Mr. R. C. DeMange prepared the text-figures, which have been made strictly accessory to the text itself. This part has been further helped by references to Britton and Brown's *Illustrated Flora*, and to Engler and Prantl's *Pflanzenfamilien*, two great works which are well illustrated and very accessible.

Finally, I beg to thank you, Dear Sir, for the assiduity with which you have endeavored to further the work, and also to thank the ever-patient printers; and most of all to recognize the Kind Providence who has kept me in good health during these years which have been devoted in large measure to a very enjoyable, though sometimes rather tedious task.

Yours ever truly,

GEORGE MACLOSKIE.

NOTES FOR BOTANISTS.

I. NEW SPECIES NAMED AND DESCRIBED IN THIS VOLUME.

(1) Some of these have, with my permission, previously appeared elsewhere, and are here transcribed: viz.:

Blepharostoma pilosum Evans (Aug., 1898), p. 41, pl. iv, figs. 1–6.
Jungermannia hatcheri Evans (Aug., 1898), p. 45, pl. v, figs. 1–7.
Tylimanthus anderssonii (Aongstr.) Evans (Aug., 1898), p. 56, pl. vi, 10–19.
Hamadryas sempervivoides Sprague (May, 1902), p. 414, pl. xvi.

(2) Here first described.

A. Mosses.

Anisothecium perpusillum Dus., p. 66, pl. vii, 1, 2.
Dicranoweisia perpulvinata Dus., p. 67, pl. vii, 3, 4.
Dicranum cirrhifolium Schpr., p. 69, fig. 3, pl. vii, 5–7.
D. scaberrimum Dus., p. 70, fig. 4, pl. viii, 1.
D. dicranellatum Dus., p. 74, fig. 73, pl. viii, 2, 3.
Barbula perrubiginosa Dus., p. 75, fig. 6, pl. viii, 4.
Grimmia fallax Dus., p. 77, fig. 7, 8, pl. viii, 5, 6.
G. macropulvinata Dus., p. 78, fig. 8, pl. viii, 7.
Orthotrichum macloskii Dus., p. 80, fig. 9, pl. viii, 8–11.
O. compactum Dus., p. 81, fig. 10, pl. ix, 1–3.
Ulota hamata Dus., p. 82, fig. 11, pl. ix, 4.
Macromitrium bifasciculare C. Müll., p. 83, fig. 12, pl. ix, 5.
Zygodon curvicaulis Dus., p. 84, fig. 13, pl. ix, 6, 7.
Z. hatcheri Dus., p. 86, fig. 14, pl. ix, 8, 9.
Leptobryum pottiaceum Dus., p. 87, fig. 15, pl. ix, 10–12.
Bryum lamprochæte Dus., p. 89, fig. 16, pl. ix, 13–15.
B. vernicosum Dus., p. 90, fig. 17, pl. x, 1, 2.
B. rigochæte Dus., p. 91, fig. 18, pl. x, 3, 4.

B. hatcheri Dus., p. 92, fig. 19, pl. x, 5, 6.
Webera lonchochæte Dus., p. 94, fig. 20, pl. x, 7–9.
Meesea patagonica Dus., p. 95, fig. 21, pl. xi, 1.
Philonotis parallela Dus., p. 97, fig. 22.
Plagiothecium leptoplumosum Dus., p. 100, fig. 23, pl. xi, 3–5.
Sciaromium depastum Dus., p. 101, fig. 24, pl. xi, 2.
Sc. gracile Dus., p. 102, fig. 25, pl. xi, 6.
Hyphnum perplicatum Dus., p. 103, fig. 26, pl. xi, 7.

B. Phanerogams.

Potamogeton linguatus Hagstr., p. 149.
Arjona tuberosa, var. nov. *lanata*, p. 342, pl. xvi.
Quinchamalion majus spegazzinii, var. nom. nov., p. 343.
Myosurus gracilis (Speg.), sp. nov., ex var., p. 403.
Ranunculus alboffii (Alboff), nom. nov., p. 405.
Draba hatcheriana Gilg, p. 444, pl. xviii B.
Acæna alboffii (Alboff), nom. nov., p. 477.
Oxalis loricata Dus., p. 540.
Lysimachia marginata Macl., p. 652.
Plantago (*Plantaginella*) *cœlorrhiza* Morris & Macl., p. 734, pl. xxv.
Senecio alboffianus (Alboff), nom. nov., p. 838.
S. dusenii O. Hoffm., p. 844, pl. xxx B.
S. hatcherianus O. Hoffm., p. 847, pl. xxx A.
Nassauvia dusenii O. Hoffm., p. 879, pl. xxx C, D.
Triptilion dusenii O. Hoffm., p. 885, pl. xxx E.

II. REVISION OF SOME SPECIFIC NAMES.

Deschampsia philippi (Phil.), vice *D. tenella*, p. 203 (see p. 961).
Bromus hackeli (Hack.), vice *B. patagonicus* Hack., p. 241.
Sieglingia antarctica (Hook. f.), vice *Triodia antarctica* Hook. f., p. 214.
Brodiæa spegazzinii, p. 305, is identical with *Juncoides patagonicum* (Speg.), p. 302, and should be omitted.
Brodiæa luzula (Speg.), vice *Luzula patagonica* Speg., p. 305.
Astragalus dusenii (Dus.), vice *A. brevicaulis* Dus., pp. 504, 962.
A. distinens (Gray), vice *Phaca* (*Astragalus*) *distans* Gray, p. 505.

Patagonium carnosum Dus., is to be deleted, being identical with *P. salicornioides* (Speg.) Speg. The original description overlooked the tubercles of the fruit, and for this reason Dusén concluded that he had got a different plant; p. 513.

Loasa karraikensis vice *L. patagonica* U. & G. (non Speg.), p. 587. See p. 962.

Ugni ugni (Mol.), vice *Myrtus ugni*, and vice *Ugni molinæ*, p. 602.

Nardophyllum nardophyllum (O. Ktze.), vice *Aster nardophyllum*, p. 784. See p. 963.

Senecio magellanensis (Phil.), vice *S. magellanicus* Phil., p. 852.

Nassauvia candollei (DC.), vice *Nassauvia* (*Panargyrus*) *lagascæ* (DC.), p. 878.

Page 379 the name *Calandrinia densifolia* should be *C. densiflora*, and in p. 796 *Erigeron spinulosus* ought to be *E. spiculosus*.

Whilst complying with the rule which produces such names as *Ugni ugni*, I have never approved of this rule. I think that when a specific name is promoted so as to become generic, then priorities shall be properly maintained by demoting the previous generic name so as to become specific. Thus I should make the old name *Myrtus ugni* Mol. become *Ugni myrtus* (Mol.); and *Aster nardophyllum* O. Ktze. become *Nardophyllum aster* (O. Ktze.).

Collomia pusilla Dus., p. 670, was based on insufficient material, and on his recent exploration its author, Dr. Dusén, found that it is *Androsace salaci* F. Kurtz; also that it is identical with *A. septentrionalis* Speg. (non Linn.). He adds "Perhaps *A. salaci* may be identical with *A. occidentalis* Pursh." Through his favor I am able to compare it with *A. occidentalis*, and I find them to be quite different.

The beech figured on Plate XIV as the host of *Myzodendron*, is of the species *Nothofagus pumilio* (P. & E.) Blume. On the plate it is erroneously assigned to *N. antarctica*, whose leaves are correctly figured on page 327.

Dr. Dusén calls my attention to the difference between Sprague's description of *Hamadryas sempervivoides*, p. 414, with laciniæ of leaves glabrous, and its figure in Plate XVI which presents the laciniæ as ciliate or hairy. The young specimens recently sent me by Dusén have the laciniæ quite glabrous, but older specimens have the leaf-sheath woolly, as stated by Sprague; and this woolliness invades the laciniæ, as a tomentum, which was overlooked by Sprague. The hairiness of the plate is the artist's interpretation of this webby tomentum.

Plate XV. The right name of the plant figured is *Escallonia virgata* Pers. (of Saxifragaceæ, p. 464). The note on p. 419, line 3, and the perigyny shown by the figure dispose of the trial-name, *Berberis virgata*, which escaped notice until Dr. Dusén sent me the correct name. He also informs me that the Hatcher specimen called *Berberis ruscifolia* (p. 418) is *B. ilicifolia*, that the *Patagonium mucronatum* (p. 517) is *P. lotoides*, and that the specimen called *Verbena tridactyloides* (p. 690) is *Euphrasia antarctica* (p. 727), of which I have also got other Hatcherian specimens. He displaces some of the specific names as being only synonyms, viz.: *Senecio kurtzii* is *S. kingii* (a radiate form of the latter); *Senecio vaginæfolius* is *S. argenteus;* and in the same line Senhor Teodoro Stuckert, of Cordoba, makes *Baccharis dusenii* (p. 804) a synonym of *B. melanopotamica.* I respectfully invite further corrections from botanists, with a view to using them some day for a supplemental Bulletin.

III. NEW GENERIC NAMES.

As some new genera erected by Spegazzini, and one by Hoffmann, have not yet got into the textbooks their descriptions are given in full.

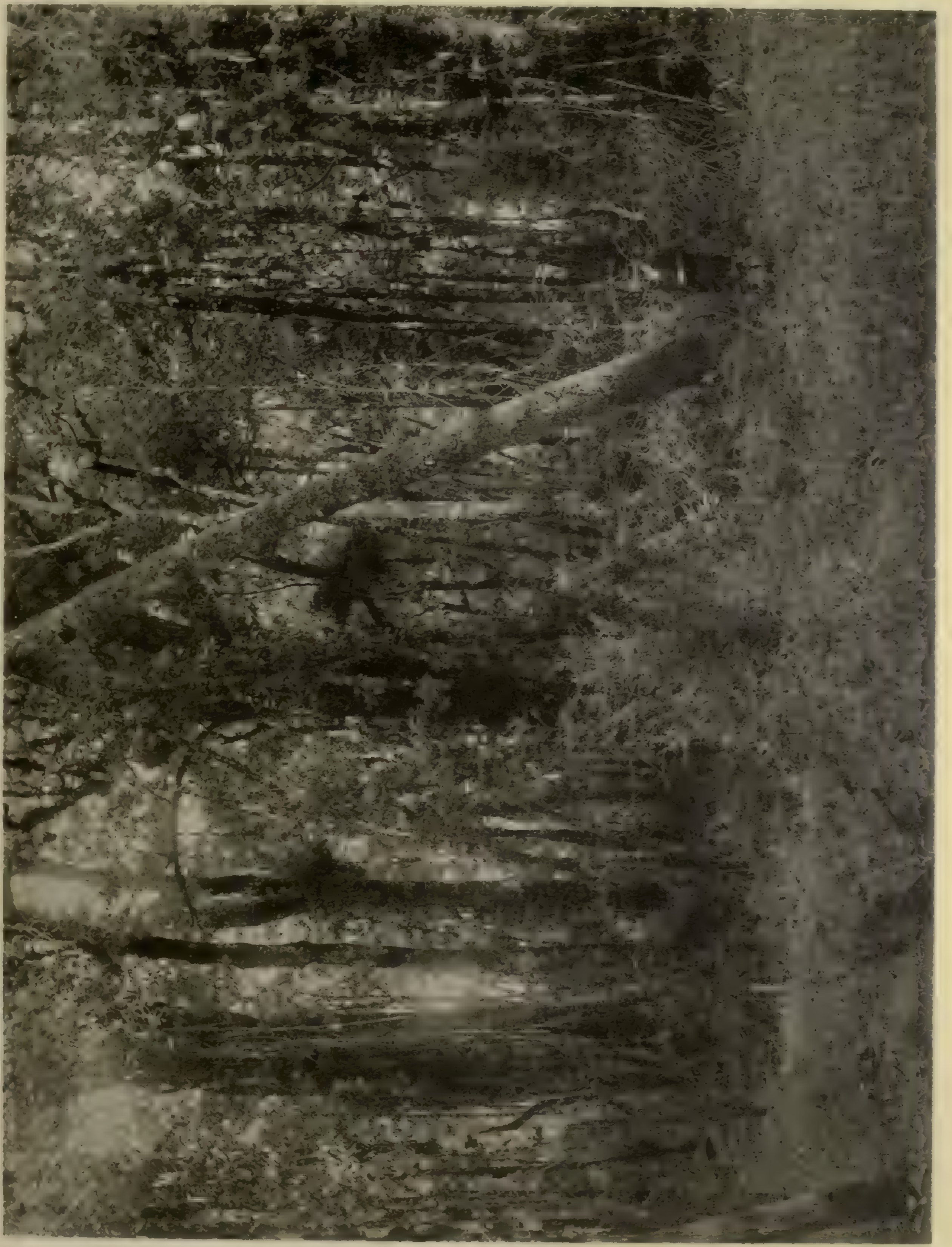
Of Spegazzini's genera we have:

Halophytum (Chenopodiaceæ), p. 371.
Amarantellus (Amarantaceæ), p. 374.
Philippiella (Caryophyllaceæ), p. 397.
Delpinoëlla (Cruciferæ), p. 427.
Aonikena (Euphorbiaceæ), p. 555.
Monopyrena (Verbenaceæ), p. 692.
Benthamiella (Solanaceæ), p. 712.
Strongylomopsis (Compositæ), p. 886.
Ameghinoa (Compositæ), p. 886.

Hoffmann's new genus of Patagonian plants is *Dusenia* (Compositæ), p. 866, with fig. 105.

Recent revisions of generic names have caused extensive changes in the complexion of the names of plants, as presented by the Second Supplement of the Index Kewensis, and other works. When the revision involves a change of gender of the generic name, as with *Luzula* becoming *Juncoides*, *Adesmia* becoming *Patagonium*, and *Davaua* becoming *Schinus*, terminal changes of the specific names usually, but not always follow suit.

PLATE I



PRIMEVAL FOREST IN GUAITECOS ISLAND.

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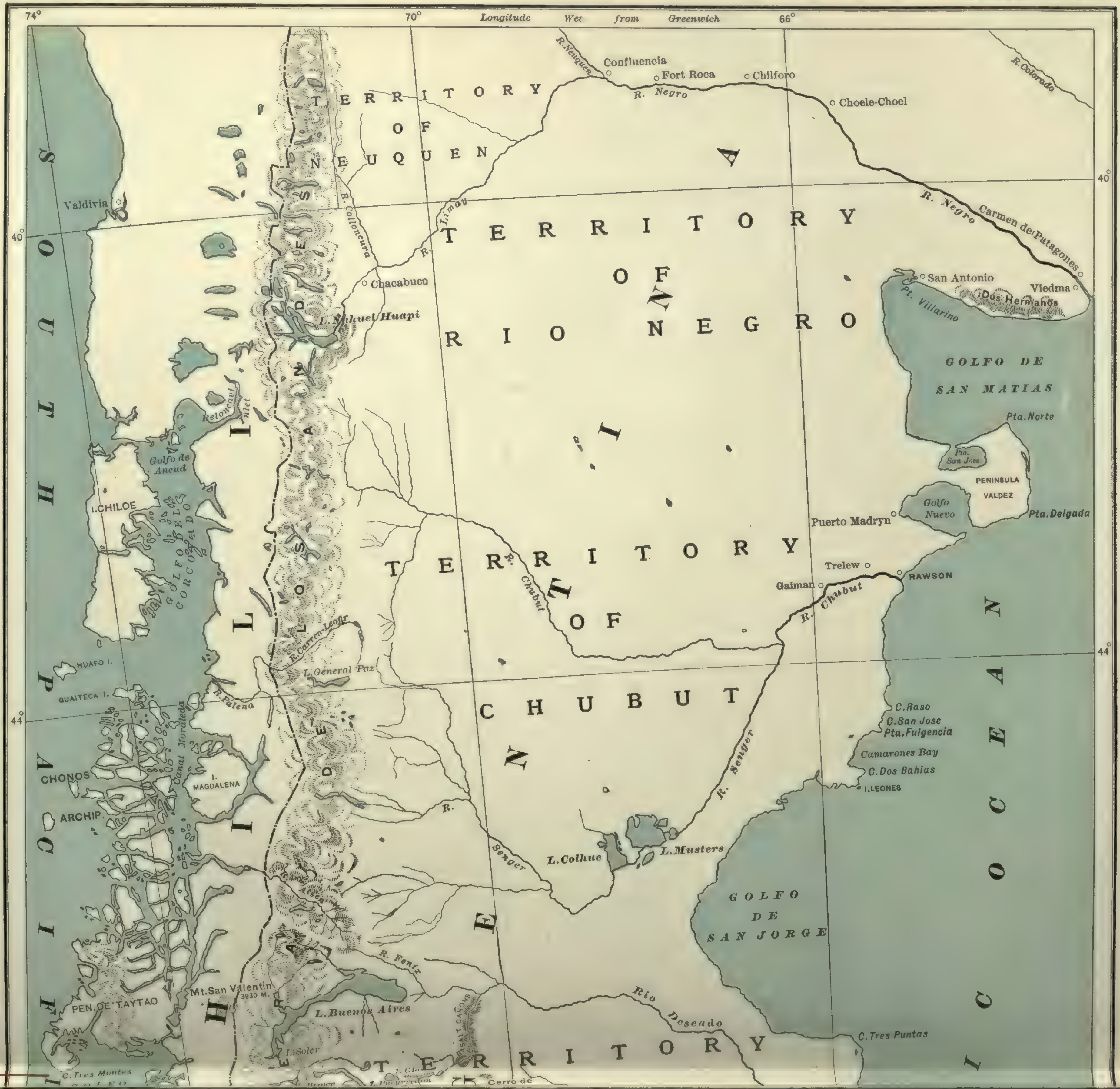
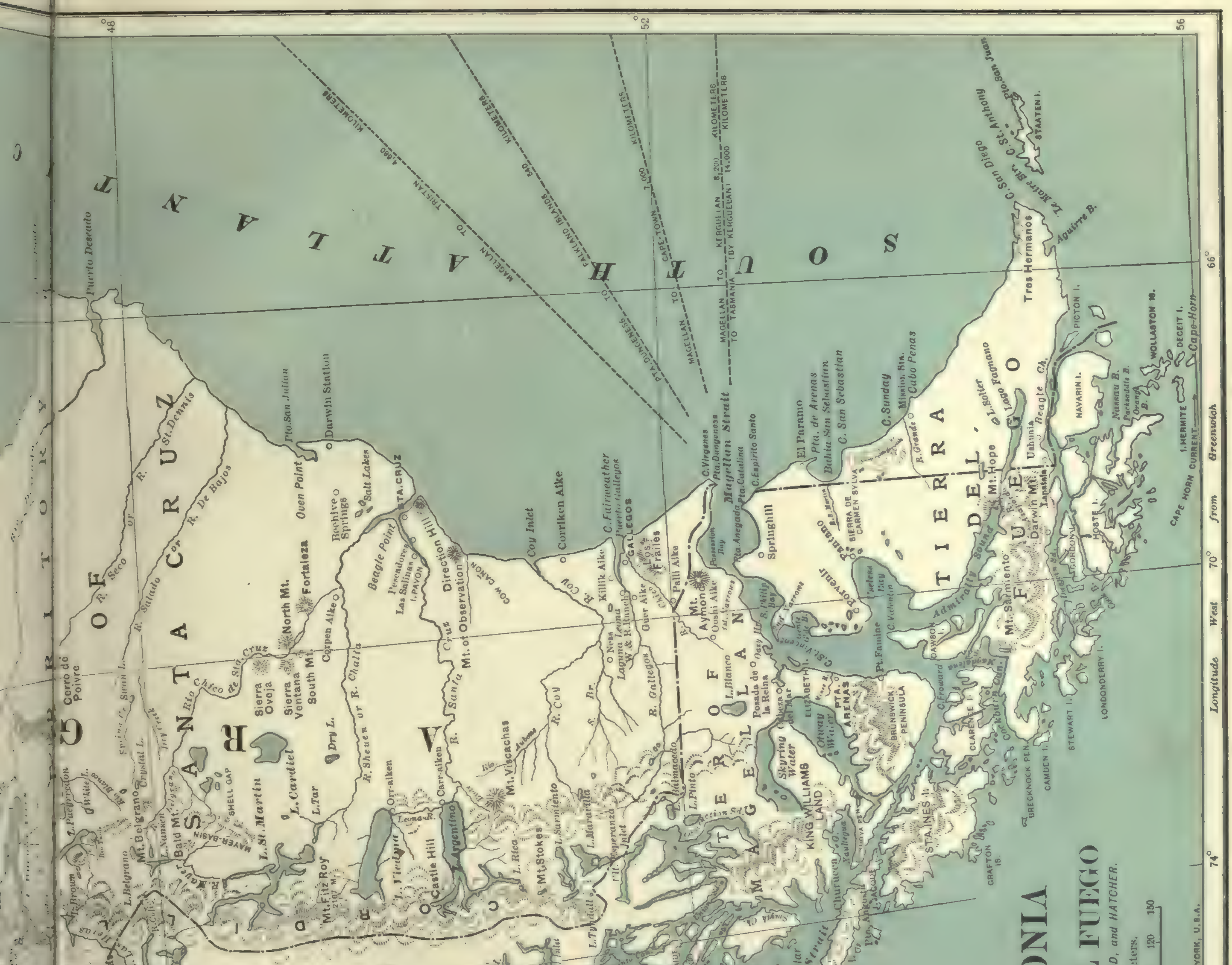

74°
70°
Longitude West from Greenwich
66°
40°
44°
TERRITORY OF NEUQUEN
TERRITORY OF RIO NEGRO
TERRITORY OF CHUBUT
TERRITORY
ARGENTINA
CHILE
LOS ANDES
SOUTH PACIFIC
OCEAN
R. Neuquen
Confluencia
Fort Roca
Chilforo
R. Negro
Choele-Choel
R. Colorado
Carmen de Patagones
Viedma
Dos Hermanos
San Antonio
Pt. Villarino
GOLFO DE SAN MATIAS
Pta. Norte
Pto. San Jose
PENINSULA VALDEZ
Golfo Nuevo
Pta. Delgada
Puerto Madryn
Trelew
RAWSON
Gaiman
R. Chubut
R. Limay
R. Colloncura
Chacabuco
L. Nahuel Huapi
Valdivia
Reloncavi Inlet
Golfo de Ancud
I. CHILOE
GOLFO DEL CORCOVADO
HUAFO I.
GUAITECA I.
R. Palena
Canal Moraleda
I. MAGDALENA
CHONOS ARCHIP.
R. Carren-Leofu
L. General Paz
R. Senger
L. Colhue
L. Musters
C. Raso
C. San Jose
Pta. Fulgencia
Camarones Bay
C. Dos Bahias
I. LEONES
GOLFO DE SAN JORGE
R. Aisen
R. Fenix
L. Buenos Aires
Mt. San Valentin 3930 M.
PEN. DE TAYTAO
BASALT CAÑONS
Rio Deseado
C. Tres Puntas
L. Soler
C. Tres Montes
Cerro de



PATAGONIA AND TIERRA DEL FUEGO

After MORENO, NORDENSKJÖLD, and HATCHER.

Scale of Kilometers.
0 30 60 90 120 150
SANTA CRUZ
TERRITORY OF SANTA CRUZ
MAGELLAN TERRITORY
TIERRA DEL FUEGO
SOUTH ATLANTIC OCEAN
PACIFIC OCEAN
Longitude West from Greenwich
48°
52°
56°
66°
70°
74°
MAGELLAN TO TRISTAN 4,950 KILOMETERS
MAGELLAN TO FALKLAND ISLANDS 540 KILOMETERS
PTA DUNGENESS TO CAPE TOWN 7,000 KILOMETERS
MAGELLAN TO KERGUELAN 8,200 KILOMETERS
MAGELLAN TO TASMANIA (BY KERGUELAN) 14,000 KILOMETERS
WEST MAGELLAN TO HAWAII 11,000 KM
WEST MAGELLAN TO NEW ZEALAND 7,700 KM.
Puerto Desado
Cerro de Poivre
Pto. San Julian
Darwin Station
Oven Point
Salt Lakes
Beehive Springs
STA. CRUZ
Beagle Point
Direction Hill
Mt. of Observation
Coy Inlet
Corriken Aike
C. Fairweather
Puerto Gallegos
GALLEGOS
Los Frailes
Palli Aike
Mt. Aymond
C. Virgenes
Pta. Dungeness
Magellan Strait
Pta. Catalina
C. Espiritu Santo
El Paramo
Pta. de Arenas
Bahia San Sebastian
C. San Sebastian
C. Sunday
Mission Sta.
Cabo Penas
R. Grande
L. Solier
Lago Fagnano
Mt. Hope
Ushuaia
Beagle Ch.
Tres Hermanos
Aguirre B.
C. San Diego
C. St. Anthony
Le Maire Str.
Pto. San Juan
STAATEN I.
PICTON I.
NAVARIN I.
Nassau B.
WOLLASTON IS.
DECEIT I.
Cape Horn
I. HERMITE
CAPE HORN CURRENT
HOSTE I.
GORDON I.
LONDONDERRY I.
STEWART I.
CAMDEN I.
BRECKNOCK PEN.
Mt. Sarmiento
Darwin Mt.
Admiralty Sound
DAWSON I.
C. Froward
Pt. Famine
PTA. ARENAS
BRUNSWICK PENINSULA
ELIZABETH I.
Otway Water
Skyring Water
KING WILLIAMS LAND
Posada de la Reina
L. Blanco
Springhill
Porvenir
SIERRA DE CARMEN SYLVA
Useless Bay
Laguna Leona
Killik Aike
R. Gallegos
R. Coy
Mt. Viscachas
Carr-aiken
Orr-aiken
L. Argentino
Castle Hill
L. Viedma
Mt. Fitz Roy
L. St. Martin
L. Cardiel
L. Tar
SHELL GAP
MAYER-BASIN
Bald Mt.
Mt. Belgrano
L. Belgrano
L. Pueyrredon
Mt. Las Heras
Sierra Oveja
Sierra Ventana
South Mt.
North Mt.
Fortaleza
Corpen Aike
R. Chico de Sta. Cruz
R. Sheuen or R. Chalia
R. Santa Cruz
R. Seco or R. Salado
R. De Bajos
St. Dennis
Dry L.
Mt. Stokes
L. Sarmiento
L. Maravilla
Ultima Esperanza Inlet
L. Pinto
Balmaceda
STAINES P.
GRAFTON IS.
DESOLATION I.
C. Pillar
C. Deseado
Magellan Strait
QUEEN ADELAIDE ARCHIPELAGO
HANOVER I.
Nelson Str.
WELLINGTON I.
Trinidad Canal
M. DE DIOS ARCHIP.
DK. OF YORK I.
CAMPAÑA I.
WAGER I.
BYRON I.
GOLFO DE PEÑAS
Canal Messier
Churruca
Pto. Angosto
Smyth Ch.

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PART I.

THE VEGETATION OF WESTERN PATAGONIA.

BY

P. DUSÉN.

INTRODUCTION.

IN the years 1895–1897 I travelled in Tierra del Fuego, Patagonia, and southern Chili on a general exploration of the botany and geology of that section, but making the moss-vegetation of the several districts the subject of my particular attention. It was therefore a great pleasure to me, on my return from South America, to receive for examination, from Professor George Macloskie, of Princeton University, a collection of mosses, which had been brought home from Tierra del Fuego and Patagonia by Mr. J. B. Hatcher. Before giving an account of these mosses, I may perhaps be allowed in a few words to describe the leading features of the western Patagonian vegetation. There is, I think, all the more need for this course, as our knowledge of this vegetation is very incomplete, being founded on only a few short notes in the books of Charles Darwin, R. O. Cunningham and a few other travellers, and on statements scattered through certain purely floristic works. For the northernmost section of western Patagonia we have a couple of detailed accounts by Dr. Ch. Reiche, describing the vegetation along the Rio Manso, which flows into the Reloncavi Inlet, and that of the district around the mouths of the Rio Paléna. We have hardly any other information on the subject.

The following description of the western Patagonian vegetation is founded upon my own explorations in the westernmost parts of the Straits of Magellan, in Newton Island (lat. 51° 53′ S.), at Puerto Bueno (about 51° S.) and along Molyneux Sound (about 50° 16′ S.), also upon my observations as a member of an expedition to the Rio Aysen, the expenses of which were defrayed by the Chilian government, and during a subsequent exploration of the Guaitecas Islands (about 43° 50′ S.).

The mighty chain of the Andes, the prevailing westerly and southwesterly winds, and the influence of the Pacific Ocean are the chief factors regulating the climate of this region. In the extensive archipelago and on the western slope of the Cordillera, as might have been expected beforehand, the climate is decidedly maritime. The rainfall is considerable and, though not definitely ascertained, it may amount to about three meters per annum, and fog is the rule. In the southernmost part of the coast district severe frosts and snow are not uncommon, while in the northern section even a slight frost is very rare and snow does not occur in the islands and coast-district proper.

On the other hand, the eastern slope of the Cordillera naturally has a much drier climate, with far greater extremes of temperature for the summer and winter months than in the coast district, snow not being uncommon. Farther east the moisture of the air rapidly decreases and the steppes proper have an extremely dry climate. Judging from my own experience in the neighborhood of Lake Nahuel-huapi, the lowest winter temperature is not below 10° C. (14° F.).

The differences of climate on the two sides of the Cordillera produce a complete difference in vegetation between the two slopes. In the damp coast district very dense forests predominate, composed chiefly of evergreen beeches with small coriaceous leaves, while the forests of the eastern slope are thin and park-like, also composed of beeches, but these have deciduous leaves. The other vegetation of these two sections shows contrasts quite as striking. Farther eastward the park-like forests of deciduous trees are replaced by the Patagonian steppe. From what I saw in the upper Aysen valley, the boundary line between the evergreen and the deciduous beech forests is very marked; they do not interosculate with each other. The case is different, however, with the deciduous forests and the steppes, in so far as smaller steppes are occasionally met with in the forest region long before the wide, unbroken plain is reached. But the limit between forest and steppe appears in all cases to be well defined, the transition from one to the other being quite sudden. West Patagonia may accordingly be divided into three belts, each running parallel with the Cordillera and each with a markedly different vegetation: (1) the rainy district, comprising the archipelago and the western slope of the Cordillera, the vegetation of which may be termed the *community of evergreen beeches;* (2) the district on the eastern slope of the Cordillera, with a moderate rainfall, the vegetation of which may be characterized as the *community of deciduous beeches;* (3) the steppe region, still farther eastward. These divisions have their counterparts in the three similar ones into which I have elsewhere divided the Magellan territory.[1]

Within the two first-named belts the forest predominates, broken in some places by smaller treeless areas, which, however, are of only secondary importance. More remarkable are the sections above the forest-line, the uplands proper. These I know only so far as the southernmost part of western Patagonia is concerned, since the above-mentioned expedition to the Rio Aysen never succeeded in reaching the end of the forest, there being such a dense undergrowth that we did not once reach an altitude above 200 meters. Owing to the limited time at my disposal the attempt had to be given up, the forest-line here running at the height of about 1000 meters. My account of the western Patagonian vegetation must therefore be deficient in that the flora of the fell or upland district can be touched upon in part only.

I. THE COMMUNITY OF EVERGREEN BEECHES.

The coast district of western Patagonia, in the whole of its length, including the archipelago, is covered with particularly dense primeval forests, very inaccessible to the traveller. This inaccessibility is due not only to the compactness of the vegetation, but also to the number of fallen and decaying trunks, which bar the way in all directions. In the southern parts of the district the undergrowth of bushes is neither very vigorous nor very diversified, but farther north it is more robust and richer in species, forming an impediment not easy to surmount. As a rule, the thickets are everywhere exceedingly dense.

A very remarkable and important feature of the vegetation is the dominant part played by the mosses and especially by the *Hepaticæ*. Whether wooded or not, the ground is everywhere entirely covered with mosses. Every decaying tree is soon lined with these plants and the living trees are more or less taken possession of by the same invaders. Some of these species have a very striking capacity for forming hillocks, the ground between the trees being studded with elevations, which occasionally reach the height of a man. As characteristic of this district should also be mentioned the *Stictaceæ* among the lichens and the *Hymenophyllaceæ* among the ferns.

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[1] *Dusén, P.* Ueber die Vegetation der Feuerlandischen Inselgruppe: Engler's Botanische Jahrbücher, Bd. XIV, Heft 2, 1897.

Dusén, P. Die Gefässpflanzen der Magellansländer nebst einem Beitrage zur Flora der Ostküste von Patagonien: Svenska Exped. till Magellansländerna; Bd. III, No. 5, p. 95.

In the northern and southern sections of this region the vegetation of the forest and thickets naturally prevents any great variety of composition. In the southern parts of western Patagonia the vegetation does not differ, on the whole, from that of the westernmost parts of the Magellan territory. In the northern section, for instance, in the Guaitecas Islands, which are the outposts to the north of the Patagonian archipelago, it is closely analogous to that of southern Chili. On the other hand, the cryptogamic vegetation is far from showing the same variety of composition and appearance in the different parts of this district. In the whole of this area it is nearly the same, and even in the Guaitecas Islands, taken all round, it has the same complexion as in the most westerly parts of the Magellan territory, although, of course, some species which occur in the one section are not found in the other.

There is no doubt, however, that the evergreen forests, especially with regard to their undergrowth, show dissimilarities enough in their different parts to justify their division into sub-sections. How such a division should be made, future explorers may decide; here I wish only to present some facts that, to me, appear to point in that direction.

In the northern parts of our district the undergrowth is, to a small extent, made up of some species of *Chusquea*, tall, robust grasses, somewhat resembling the species of *Bambusa*. The species found in the northern archipelago is characterized by its climbing propensity and it not infrequently reaches the upper parts of the trees. But it is not so common that it can be considered a very conspicuous feature of the vegetation. Whether a subdivision of the archipelago ought to be made on the basis of the occurrence of this species in one district and its absence from another, I leave an open question. According to my knowledge of the vegetation of the archipelago, such a subdivision is hardly necessary and I shall therefore include in a single total all the islands and the coast district of western Patagonia from the Straits of Magellan northward to the Ofqui-ness (about 46° 45′ S. lat.) and the coast still farther to the north.

A species of *Chusquea*, different from the insular species and probably *C. quila* Kunth,[1] occurs in the northernmost part of the mainland of west Patagonia, reaching, according to Dr. Steffen,[2] its southern limit at the Ofqui-ness. Whether this species actually occurs in the littoral districts, I do not know, but very much doubt its occurrence there. On the other hand, it is met with in enormous masses in the transverse valleys of the Cordillera, where it constitutes the great bulk of the undergrowth and is the chief obstruction to the traveller. This occurrence in masses is sufficient reason for setting apart these valleys as a separate section of the *community of evergreen beeches*, but there are other reasons also. One is that the forests here are thin or open, which makes them look like parks, and to this may be added that the ground lacks that very dense covering of mosses which, in the archipelago and littoral, is such an extremely characteristic feature of the vegetation. From the most representative plant of these transverse valleys this subsection of the evergreen beech forests may be termed the *Quila* formation.

Lastly and before proceeding to give an account of the different species that are to be found in these forests, I wish to point out their great likeness to the forests of the Tropics, especially in the north of Patagonia and, above all, in the *Quila* formation. These forests are mixed ones, their trees being evergreen with coriaceous leaves; but their undergrowth of bamboo-like grasses, the occurrence of epiphytic phanerogams, the number of ferns, especially of *Hymenophyllaceæ*, and mosses of the genera *Pilotrichella* and *Cyathophorum*, frequently in luxuriant festoons hanging from the branches, give to the forests an appearance very similar to the primeval forests of the tropical regions.

I. THE VEGETATION OF THE SOUTHERN SECTION OF WESTERN PATAGONIA.

Although, as I have already mentioned, I include together all the islands of the archipelago and the coast of the mainland, in one whole, which can scarcely be subdivided, or at least, not at present, nor until the entire district shall have been carefully explored, I find it necessary, in my account of its vegetation, to treat its northern and southern parts separately. My only reason for this is the unequal number of species in the outlying sections north and south. I shall begin with the vegetation of the southern section, by which I mean the territory between the Straits of Magellan and Molyneux Sound.

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[1] It is stated (Cf. Frömbling: Ueber botanische Excursionen während eines dreijährigen Aufenthalt in Chile: Botan. Centralblatt, Jahrg. XVI) that the *Chusquea* grasses flower but once in three or four years, and, strange to say, all the individuals in a large district are in flower at the same time. Of the species found by me in western Patagonia not one was in bloom and trustworthy identification was therefore impossible.

[2] *Steffen, H.* Reisen in den Patagonischen Anden: Verhandl. d. Ges. für Erdkunde zu Berlin, 1900, No. 4, p. 220.

The forests here are almost entirely composed of two species of trees, *Nothofagus betuloides* (Mirb.) Blume, and *Drimys winteri* Forst. The only conifer to be found here, *Libocedrus tetragona* (Hook.) Endl., can hardly be considered forest-forming. It generally grows in small, thin groves, or sparsely intermingled with *Nothofagus* and *Drimys*, as a rule, on very boggy ground. The shrub-vegetation of these forests is neither rich in species, nor very luxuriant in habit of growth, the reason of which may, I think, be found in the prevailing climatic conditions, the deficiency of light, on account of frequent fogs and a generally clouded sky, and the dark green foliage of the trees, which admits very little sunlight. There is but one species which in the twilight of these forests, and only here, attains its full development and vigor, *Lebetanthus myrsinites* (Lam.) Endl., a small, half-climbing shrub, which often entirely covers the lower parts of the tree-trunks. Other shrubs are *Desfontainea spinosa*, Ruiz et Pav., *Berberis ilicifolia* Linn. fil., and *Pernettya mucronata* (Linn. fil.) Gaud. Of other phanerogamic plants, there are scarcely any, at least where the trees stand close together, except *Callixene marginata* Lam. On the other hand, the vegetation of epiphytic ferns is all the richer, both in individuals and species. On the trunks of the trees, as well as interwoven with the mosses covering the ground and the decaying logs, grow *Hymenophyllum tortuosum* Banks et Sol., *H. pectinatum* Cav., and *H. dichotomum* Cav., not unfrequently all together. More sparingly occur *Hymenophyllum æruginosum* Cav. and *Polypodium australe* (R. Br.), besides which the ground presents to our notice two other ferns, *Asplenium magellanicum* Kaulf. and *Gleichenia quadripartita* (Lam.) Hook., the latter growing in clusters.

Of lichens the denser forests have not many to offer, as these plants do not seem to thrive well in the dim light here prevailing. The only species met with are *Sticta caulescens* De Not. and *S. filicina* Ach. (ex. p.). The mosses, especially the *Hepaticæ*, on the other hand, occur in great numbers, carpeting the ground and covering the fallen trees with a coating of pure green. Here thrive species of *Schistochila*, such as the pretty *S. lamellistipula* Steph. and *S. lamellata* Hook., many *Lophocoleæ* (but only one in large numbers, namely, the splendid *Lophocolea gottscheæoides* Mass.), *Tylimanthus brecknockiensis* (Mass.) Steph., numerous species of *Plagiochila*, for instance, *P. longissima* Steph., *P. elata* Tayl., *P. duricaulis* Hook. et Tayl., *P. dura* De Not., *P. obcuneata* Steph., and *P. patagonica* Besch. et Mass. Epiphytic on other mosses and on *Hymenophyllaceæ* are *Chiloscyphus striatellus* Mass., *Balantiopsis chilensis* Steph., *Mastigobryum lechleri* Steph. and *M. peruvianum* Nees, *Aneura crispa* Schffn. and *A. prehensilis* (Tayl.) Mitt., *Anthoceros endivæfolius* Mont., besides many others of less importance. The *Musci*, as I have previously stated, are sparingly represented and chiefly by species of *Pterygophyllum*, *Mniadelphus*, *Eriopus* and *Hypopterygium*. *Dicranum*, *Campylopus*, *Ulota* and other genera, elsewhere rich in species, have only a few representatives in the denser and darker forests.

Far richer in species is the flora of the less thickly wooded ground, with its better light. With the exception of *Lebetanthus myrsinites* (Lam.) Endl., the same phanerogamic plants are found here as in the denser forest. With these are associated *Philesia buxifolia* Lam., *Chiliotrichium diffusum* Forst., *Myrteola nummularia* (Poir.) Berg., *Empetrum rubrum* Vahl., *Escallonia serrata* Sm., *Acæna pumila* Vahl., *Pinguicula antarctica* Vahl., *Senecio smithii* DC., *Perezia magellanica* (Linn. fil.), Lag., *Lagenophora nudicaulis* Comm., *Phyllachne uliginosa* Forst., *Senecio trifurcatus* Less., *Tapeinia magellanica* (Lam.) Juss., *Marsipospermum grandiflorum* (Linn. fil.) Hook., *Carex microglochin* L., subsp. *fuegina* Kükenth., *Festuca commersonii* Franch., *Deschampsia kingii* (Hook. fil.) Desv., and *Blechnum magellanicum* (Desv.) Mett., besides the gregarious species, *Donatia fascicularis* Forst., *Astelia pumila* (Forst.) R. Br., *Gaimardia australis* Gaud., and *Oreobolus obtusangulus* Gaud., each of them forming large and thick clusters and often accompanied by *Tetroncium magellanicum* Willd., *Drosera uniflora* Willd., and two species of *Caltha*, *C. dioneæfolia* Hook., and *C. appendiculata* Pers., the former especially growing in compact groups.

It should be explained that by far the largest part of the ground in the thinly wooded section is occupied by mosses, which give it a yellowish brown tint, not only in the wooded places, but also in the treeless areas higher up the mountain slope. The *Musci* are comparatively numerous and appear in masses here and there, particularly species of *Dicranum*, such as *D. imponens* Hook. fil. et Wils., *D. australe* Besch., and *D. billardieri* Schwaegr. The same applies to *Campylopus flavo-nigritus* sp. nov., and *Rhacomitrum lanuginosum* (Hedw.) Brid., to which should be added, for the higher and treeless areas, *Dicranum harioti* Besch., *Rhacocarpus humboldtii* (Spreng.) Lindb. and *R. patagonicus* Broth. n. sp., besides many species of the genus *Andreæa*. The *Hepaticæ*, however, predominate here also, and the following should be singled out because of their great abundance and because of their congregating into large mats: *Diplophyllum densifolium* Hook., *Lepicolea ochroleuca* (Spreng.) Spruce, *Schisma chilensis* De Not., *Isotachis madida* Tayl., and *Adelanthus unciformis* (Hook. et Tayl.) Mitt., besides which I should not omit to mention *Lepidolæna magellanica* Lam., *Chiloscyphus horizontalis* (Hook.) Nees, *Schistochila gayana* Gottsche and *S. pachyla* Tayl., each of these now growing in distinct tufts, or again intermingled with other mosses and conspicuous for their size or beauty, or for other reasons.

As already mentioned, the shore-thickets are very dense, being made up of some shrubs that thrive best here and scarcely occur outside of the littoral proper. The following are found closely intermingled with one another: *Escallonia serrata* Sm., *Tepualia stipularis* Gris., *Veronica elliptica* Forst., *Maytenus magellanica* (Lam.) Hook. fil., *Desfontainea spinosa* Ruiz et Pav., *Fuchsia coccinea* Ait., *Pernettya mucronata* (Linn. fil.) Gaud., *Pseudopanax lætevirens* Gay., and *Philesia buxifolia* Lam. These thickets are also the chief resort of the lichens of this district, which here appear comparatively rich both in variety of species and profusion of individuals, not only on the twigs of the bushes, but also on the ground. The following are the most important: *Pseudocyphellaria hirsuta* (Mant.) Malme, *P. fossulata* (Duf.) Malme, *P. orymæa* (Ach.) Malme, *P. orymæa*, subsp. *flavicans* (Hook. et Tayl.) Malme, *P. freycinetii* (Del.) Malme, var. *isidioloma* (Nyl.) and *Nephroma cellulosum* Ach. Nearly always on the outside of the thickets are found the phanerogamous *Cotula scariosa* (Cass.) Franch., *Apium graveolens* L. and, sparingly, *Gunnera magellanica* Lam. and *G. lobata* Hook. fil. Lastly, I may add that the twigs of the bushes are also often taken possession of by mosses, particularly by species of *Ulota* aud *Macromitrium*, such as *Ulota fulvella* Mitt. and *Macromitrium tenax* C. Müll. The vegetation of the rocks by the shore is made up of *Crassula moschata* Forst. and of mosses belonging to the genera *Hypnum*, *Campylopus*, *Dicranum* and *Bryum*, besides a few crust lichens.

Of the flora of the fell district proper I have no personal knowledge, but am strongly inclined to believe that it does not differ materially from that of the corresponding stations of the westernmost parts of the Straits of Magellan. I think, therefore, that I should here give some of my own observations in Desolation Island, as, on the whole, they may convey an adequate idea of the flora of our upland district.

The forest-line is at the height of about 400 meters and the majority of the species belonging to the coast district extend to the same altitude; a few, such as *Crassula moschata* and *Cotula scariosa*, being restricted to the littoral, while others are met with even far above the forest-line. On or about that line is found *Nothofagus betuloides* (Forst.) Blume, a deciduous beech, appearing here as a shrub or low tree, while in Tierra del Fuego and western Patagonia, in the moderately rainy parts of which it flourishes best, it becomes a tree of considerable size. The same species occurs also on the uplands, extending up to a height of 600 meters, at least, and the higher it goes, the more stunted it is; at the upper limit of its range it is merely a small shrub, the branches of which creep along among the mosses of the ground, thus growing in the same way as the Salices and dwarf birch of the Arctic regions. There are, I dare say, few trees that vary to the same degree, from a mighty tree to an insignificant little creeper trailing along the ground. But still more in regard to its distribution this species is of very great interest. As I have already stated, it attains its full development on the eastern slope of the Cordillera. Here it descends to the lowlands at the foot of the mountains, reaching the coast about the middle of the Straits of Magellan, and it is also found in the coast district and lowlands of Fuegia. Farther west, along the Straits, it shuns the coast, and this is all the more marked as one approaches the westernmost and rainiest parts of our district. The lower limit moves continually higher and on the west coast it does not occur at all, even in the region of the evergreen beeches. That it should be altogether wanting in the coast section is very strange and seems difficult to explain, at least at first sight.

The occurrence of *Nothofagus antarctica* in the upland district is the most interesting feature of the flora. Here also the mosses predominate, especially the *Hepaticæ*, which still appear in considerable masses. Phanerogamic plants, on the other hand, are few and far between. I have already mentioned that some of the coast species ascend to the fells, such as *Lagenophora nudicaulis* (Comm.), *Perezia magellanica* (Linn. fil.) Lag., *Senecio bifurcatus* Less., and *S. acanthifolius* Hombr. et Jacq., *Marsipospermum grandiflorum* (Linn. fil.) Hook., *Caltha dioneæfolia* Hook., and *Phyllachne uliginosa* Forst., the last two named of these extending nearly as high as the snow-line. Species found only on the fells are: *Viola tridentata* Menz., *Geum magellanicum* Comm., *Acæna antarctica* Hook. fil., *Ourisia breviflora* Benth. and *O. nana* Benth., *Saxifraga bicuspidata* Hook. fil. and *S. alboffiana* Kurtz., *Luzula antarctica* Hook. fil., *Uncinia kingii* Booth., and *Stipa rariflora* (Hook. fil.) Benth.

Of the numerous *Hepaticæ* I must not omit to mention *Anastrophyllum involutifolium* (Mont.), *Isotachis anceps* Mass., *Jamesoniella grandiflora* L. et A., *Diplophyllum clandestinum* Hook., *Lepicolea quadrilaciniata* Sull.; species of *Lophocolea*, *Leioscyphus abnormis* Mass., *L. surrepens* Tayl., and *L. turgescens* Tayl., *Lepidolæna hariotiana* Mass., *Marsupella kerguelensis* Schffn., *Schistochila splachnophylla* Tayl., and *S. pachyla* Tayl., *S. planifolia* Steph. and *S. gayana* Gottsche. Musci are comparatively scarce and many of them belong to genera which are represented also in the Arctic and Subarctic zones of the northern hemisphere, such as *Andreæa*, *Conostomum*, *Psilopilum*, *Blindia*, *Rhacomitrium* and *Dichodontium*.

2. The Vegetation of the Northernmost Parts of Western Patagonia.

Many of the phanerogamic plants enumerated above as belonging to the southern section of our district are spread over the whole of western Patagonia, including the Guaitecas Islands, of whose plants I shall now give an account. But the flora of those islands — I here refer to the phanerogamic vegetation only — is chiefly composed of elements that are wanting in the south, this difference of species being the only one that can be shown to exist between the outlying parts of our district north and south, as biologically and physiologically, hardly any can be discerned.

Nothofagus betuloides (Mirb.) Blume, so common and characteristic of the southern portion of western Patagonia, is almost entirely missing in these islands. Here it is replaced by two other species of evergreen beeches, *Nothofagus dombeyi* (Mirb.) Blume and *N. nitida* (Phil.), both of which are the dominant trees of this locality. Like *Nothofagus betuloides* they have small, thick and coriaceous leaves. On the other hand, *Drimys winteri* Forst. is as common here as farther south, and *Libocedrus tetragona* Endl. appears to thrive even better than in the district of the Straits of Magellan. Although full-grown specimens of this tree are now hardly to be found in the Guaitecas Islands, because every full-sized trunk has been cut down, on account of its excellent wood, there is hardly any doubt that this species grows here in larger, closer and more immingled groves than in the southern section.

To the above-mentioned species I should add not a few others, which the Guaitecas have in common with south Chili and the opposite coast of western Patagonia. Without exception they are all evergreen; namely, *Laurelia aromatica* Spreng., *Caldcluvia paniculata* Don., *Weinmannia trichosperma* Cav., *Lomatia ferruginea* R. Br., *Edwardsia macnabiana* Grah., *Podocarpus nubigena* Lindl., species of the genus *Eugenia* and, of rarer occurrence, *Guevina avellana* Mol., and *Embothrium coccineum* Forst. The undergrowth of the forests and the thickets by the sea-beach likewise show a greater variety of species than is the case in the southern section.

A very remarkable feature in the vegetation of these islands is the occurrence of epiphytic phanerogams, which are represented by at least five species: *Mitraria coccinea* Cav., *Asteranthera chiloensis* Hanst et Kl., *Luzuriaga radicans* Ruiz et Pav., *Sarmienta repens* Ruiz et Pav., and one species belonging to the *Bromeliaceæ*, namely a species of *Rhodostachys.* Of parasitic phanerogams there is at least one, *Myzodendron punctulatum* Banks et Sol.

The vegetation varies, as to its component species, according to the nature of the ground. Generally, the soil consists of rock with a rather thick overlying layer of peat, produced by the mosses, which, in large masses, cover every inch of it. Here beeches and *Drimys* prevail, at the cost of other trees, while, in places where the lowland is made up of sand, the case is just the reverse. In other respects also the vegetation of the sandy places differs from what is the rule elsewhere. For instance, the grass *Chusquea*, which, as I have stated, belongs to the flora of northern Patagonia, is found here, and the ground lacks that close-woven carpeting of mosses so characteristic of the peat-covered rocks. Naturally, mosses occur even here, but are comparatively few and belong to species different from those of the beech forests proper.

An enumeration of species from different localities may give some idea of the vegetation of the Guaitecas. I shall begin with such as belong to the peat-covered, rocky ground, which takes up by far the larger part of these islands.

As already stated, the two beeches, *Nothofagus dombeyi* and *N. nitida*, and *Drimys winteri* predominate; other trees, such as *Laurelia aromatica*, *Lomatia ferruginea*, *Eugenia* sp., *Podocarpus nubigena* and *Caldcluvia paniculata*, being either of less importance or very uncommon. Whether *Weinmannia trichosperma*, *Embothrium coccineum*, *Edwardsia macnabiana* and *Guevina avellana* really occur here, I leave an open question. If so, they are at least extremely rare and of no consequence. *Libocedrus tetragona* I have already mentioned.

As is the case farther south, the light here is often very dim. Judging from the undergrowth which, in places, is more vigorous than in southern west Patagonia, it would appear that the trees do not join their crowns quite so closely together as in the latter section, although it may be that the wood-cutting, which has been going on in these islands for a long time, may have something to do with this phenomenon. The following species make up the undergrowth: *Desfontainea spinosa*, *Philesia buxifolia*, *Lebetanthus myrsinites*, *Pernettya mucronata* and *P. furens* Klotzsch., *Myrteola nummularia;* also, but more rarely, *Tecoma valdiviana* Phil., *Dacostea racemosa* Phil., and *Tepualia stipularis*. Of epiphytic phanerogams occur *Luzuriaga radicans* and very likely also *Mitraria coccinea* and *Asteranthera chiloensis*. Epiphytic ferns are plentiful, such as *Hymenophyllum chiloense* Hook., *H. magellanicum* Willd., *H. dichotomum* Cav., *H. bridgesii* Hook., *H. pectinatum* Cav., *H. cruentum* Cav., *H. æruginosum* Carm., *Trichomanes cæspitosum* Hook., *Asplenium trapezoides* Hook., and *Polypodium australe* (R. Br.). Most of these also grow on the ground, which likewise displays *Asplenium magellanicum*, *Blechnum magellanicum* and *Gleichenia quadripartita*.

The carpeting of mosses which covers the ground is composed mainly of *Hepaticæ*, but also *Bryaceæ* are more plentiful here than in the south; the species are the same as we already know from there; of the former, I should mention *Schisma chilensis*, *Lepicolea ochroleuca*, *Chiloscyphus horizontalis*, *Aneura prehensilis*, *A. fuegiana*, *A. crispa*, *Schistochila reicheana* Steph., *Plagiochila longissima* Steph., *P. obcuneata* and *P. dura* De Not., *Isotachis madida*, *Diplophyllum densifolium*, *Lepidozia chordu-*

lifera, *Mastigobryum novæ-zelandiæ* Mitt., *Lophocolea humilis* and *L. trachyopa* Tayl. Among the Musci the foremost place is occupied by species of the genus *Dicranum*, of which *D. billardieri*, *D. australe* and, generally, *D. imponens*, sometimes also *D. nigricaule* Aongstr. appear in great numbers. *Hypopterygium didictyon* and *H. thouinii*, *Hypnodendron krausei* (C. Müll.) Jacq., *Thamnium arbusculans* C. Müll., *Pterygophyllum obscurum* Mont., *Ptychomnium cygnisetum*, *Rhizogonium mnioides*, *Brentelia dumosa* Mitt., and *Pogonatum dendroides* Brid. are likewise worthy of notice.

On decaying trunks the *Hepaticæ* are represented by *Lophocolea*, *Lepidozia*, *Jamesoniella*, *Aneura*, *Schistochila*, *Isotachis*, and other genera, their commonest species being *Lophocolea anomada* (Mont.), *L. attenuata* Steph., *L. trachyopa* and *L. textilis* Tayl., *Jamesoniella colorata*, *Aneura conimitra* Steph., *Schistochila reicheana*, *Isotachis quadriloba* Steph., *Lepidozia cucullifolia* Steph. and *L. plumulosa*. Among the Musci the genus *Dicranum* again takes the leading place, with the same species as are predominant on the ground. As they are quite common, *Rhaphidostegium callidum* (Mont.) and *Stereodon lechleri* Mitt., which grow in large tufts, should not be omitted.

The moss-flora of the standing trunks is quite rich, comprising, of the *Hepaticæ*, species of *Lophocolea* and *Plagiochila*, such as *Lophocolea humilis*, *L. fulvella* (Tayl.), *L. cucullistipula* Steph., *L. otiphylla* and *L. homomalla* Steph., *Plagiochila bispinosa* Ldbg., *P. flexicaulis* Mont., and *P. dura* De Not.; further *Madotheca subsquamosa* N. et M., *Radula intempestiva* Gottsche, *Frullania stipatiloba* Steph., and *F. lobulata* Hook., *Trichocolea verticillata* Steph., and others. Worthy of mention among the Musci are, *Hypopterygium flexisetum* Hampe, *Pilotrichella krausei* Lor. and *P. cumingii* (C. Müll.) Lor.

In lichens also these forests are poor. Strictly speaking, there are only two species that one is sure to meet with, *Sphærophoron tener* Laur., and *S. compressus* Ach. One or two species of *Sticta* and *Pseudocyphellaria* do occur, but they are rare.

The thickets by the sea-shore are well developed and quite dense, which, I think, may be set down to the favorable light, which prevails outside the forest. They are chiefly made up of the following species: *Tepualia stipularis*, *Pseudopanax lætevirens*, *Desfontainea spinosa*, *Pernettya mucronata*, *Fuchsia magellanica* Lam., *Philesia buxifolia* and *Myrtus ugni*

Molina. Less important are *Eugenia* sp., *Rhaphithamnus cyanocarpus* Miers, *Tecoma valdiviana*, *Dacostea ruscifolia* Clos. and *D. racemosa*, *Pernettya furens* and *Berberis darwinii* Hook. *Eugenia* sp. occasionally occurs in dense copses and then generally together with *Blechnum magellanicum*. *Hymenophyllaceæ* also are plentiful in the thickets of the seashore, and to those species that I have mentioned before I may now add *Hymenophyllum caudiculatum* Hook.

In the littoral belt the lichens have their proper abode, occurring here in large masses. They belong almost exclusively to the genus *Pseudocyphellaria*, the following species being the most important: *P. fossulata* (Del.) Malme, *P. faveolata* (Del.) Malme, var. *cervicornis* (Flot.), *P. orygmæa* (Ach.) *P. urvillei* (Del.) Malme, *P. orygmæa* (Ach.) *flavicans* (Hook. et Tayl.) Malme, *P. nitida* (Tayl.) Malme, and *P. freycinetii* (Del.) Malme.

On the cliffs by the shore the vegetation is, as a rule, very poor in species. I should mention as occurring here some phanerogamic plants, as *Cotula scariosa*, *Crassula moschata*, *Colobanthus quitensis* Barth., *Juncus planifolius* R. Br., var. *demissus* Buch., and *Aira caryophyllea*, L.; of Musci, *Macromitrium bifasciculare* sp. nov., and *Barbula microruncinata* sp. nov.; and of Lichens, *Stereococaulon ramulosum* (Sw.) Ach., together with its variety *implexum* Th. Fr.

On sandy ground, which occurs only along the small bays, the vegetation of the forest is somewhat different; also that of the thickets, and especially that of the herbaceous plants, is denser here than elsewhere.

At Puerto Low, a cave on the northern side of the main island, Isla Guaiteca, the vegetation is disposed as follows: Next to the shore is a low belt, chiefly taken up by *Juncaceæ* and *Gramineæ*, next comes a belt of thickets and then the virgin forest. In the outermost belt *Deschampsia kingii* (Hook. fil.) Desv., *Elymus* sp., *Poa fuegiana* (Hook. fil.) and *Juncus lesueurii* Bol., predominate, more or less richly intermingled with the following species: *Cerastium arvense* L., *Lathyrus magellanicus* Lam. and *L. maritimus* (L.) Big., *Senecio otites* Kze. and *S. smithii* DC., *Acæna ovalifolia* Ruiz et Pav., *Galium relbun* Endl., *Libertia elegans* Poepp., *Sonchus fallax* Waltr., *Polygonum chilense* Koch, *Rumex* sp., *Cardamine ovata* Phil., *Solanum furcatum* Poir., *Apium graveolens* L., *Baccharis sagittalis* DC., *Lepidium bipinnatifidum* Desv., *Hydrocotyle* sp. (sterile), *Cotula scariosa*, *Ranunculus chilensis* DC., *Selliera radicans*

Pers., *Tetragonia expansa* Ait., *Ambrina ambrosioides* Spach., *Plantago lanceolata* L., *Stachys chonotica* Hook. fil., *Stellaria cuspidata* Willd., *Uncinia phleoides* Pers., *Carex* sp., presumably *C. darwinii* Boott. and *Blechnum chilense* (Kaulf.) Mett.

The belt of thickets is chiefly composed of *Rhaphithamnus cyanocarpus* Miers, a couple of species of *Eugenia*, *Fuchsia magellanica* and *Escallonia macrantha* Hook. et Arn. More sparingly occur *Berberis darwinii* and *B. microphylla*, *Ribes magellanicum* Poir., *Cynoctonum pachyphyllum* Decaisne, *Myrtus ugni* and *Pseudopanax lætevirens*. *Mitraria coccinea* is here rare. Both of the outer belts have a width of only a few meters each.

The most important constituents of the forest are *Caldcluvia paniculata*, *Laurelia aromatica*, *Weinmannia trichosperma*, *Lomatia ferruginea* and *Drimys winteri*. Though not absent, the two species of beech, *Nothofagus dombeyi* and *N. nitida*, are not conspicuous here. This forest is considerably taller and less dense than the beech-forest and consequently admits more light than the latter. The undergrowth, therefore, at least in places, is very luxuriant, its most conspicuous element being the *Chusquea* grass already referred to, probably *C. valdiviensis* Desv., the climbing propensities of which I have pointed out. In more open and lighter places it becomes very dense, but elsewhere only sparingly so. Besides these, the highest plants of the undergrowth are *Pseudopanax lætevirens, Rhaphithamnus cyanocarpus*, a couple of *Eugenia* species, *Tepualia stipularis, Dacostea ruscifolia, Myoschilos oblongus* Ruiz et Pav., *Philesia buxifolia, Myrtus ugni* Molina, *Tecoma valdiviana* and *Lebetanthus americanus*. Of epiphytic plants, *Mitraria coccinea*, *Asteranthera chiloensis, Luzuriaga radicans* and *Sarmienta repens* are common, the last named not unfrequently occurring in masses on sloping tree-trunks. *Rhodostachys* sp., probably *R. littoralis* Phil., on the other hand, is rare and restricted to the outskirts of the forest. Besides, the trunks are richly clothed with *Hymenophyllaceæ* and a few other ferns, and with mosses, of which I should mention *Hypopterygium flexisetum*, *Pilotrichella krausei* and *P. cumingii, Metzgeria glaberrima* Steph., *Plagiochila uncialis*, and *P. lechleri*, *Madotheca subsquarrosa* N. et M. and *Frullania chilensis* Steph.

A lower order of the undergrowth is composed of a few scattered herbs, such as *Osmorhiza berterii* DC., *Nertera depressa* Banks, *Uncinia phleoides* and *U. erinacea* Pers., and *Blechnum chilense*. The moss carpeting is comparatively scanty and *Hepaticæ* are scarce, their most important representatives being *Rigodium toxarion* (Schwaegr.) Schimp., *Hypnodendron krausei, Thamnium arbusculans* and *Monoclea forsteri* (Hook.).

From what has just been said, it will appear that the forest vegetation of the Guaitecas Islands is very different from that of the southern sections of our district, being in fact distinctly allied to that of Chiloë and southern Chili. Certain portions of the Guaitecas, however, have a vegetation, in which the southern Patagonian and Fuegian elements prevail, while the south Chilian forms are altogether wanting, or very poorly represented. Such is the case with the vegetation of the peat-bogs and also of the higher and treeless portions of the islands.

Peat Bogs.

In western Patagonia peat-bogs are rather uncommon and in our territory I know of such only in the Guaitecas. These bogs have exactly the same appearance as those of the north of Europe. The great bulk of their vegetation consists of *Sphagnaceæ*, belonging to the same species as those of the bogs of southern Sweden. The phanerogamic bog-vegetation of two districts so widely distant from each other, so far as their several species are concerned, has very little in common, but, in some cases, quite evidently shows a morphological correspondence.

The bed of *Sphagnum* is not altogether continuous, but is broken in spots by solid patches of phanerogamic plants; namely, *Donatia fascicularis, Astelia pumila, Gaimardia australis,* and *Oreobolus obtusangulus,* all of which I have already stated to belong to the southern sections of our district and which also enter into the Fuegian flora. Even Musci, such as *Dicranum australe*, and *D. billardieri*, *Campylopus flavo-nigritus*, sp. nov., and *Rhacomitrium lanuginosum*, occasionally break the continuity of the masses of *Sphagnum*. Species of *Hepaticæ* occur along with them, as *Schisma chilensis*, *Lepicolea ochroleuca*, *Diplophyllum densifolium* and *Lepidozia saddlensis*, but their assistance in producing the peat is very limited. A couple of lichens, *Cladonia pycnoclada* (Pers.) and a species of *Pseudocyphellaria* likewise belong to the bog-vegetation.

Besides the phanerogamic plants above enumerated, several others should also be mentioned. *Schœnodon chilensis* Gay. occasionally occurs in groups, but, on the other hand, I did not see *Scirpus riparius* Presl., though it may have grown here once. I noticed it, together with *Schœnodon*, growing in profusion by a lagoon, by the shore of which *Sphagna-*

ceæ were evidently advancing. The production of peat was in full swing here, and part of the lagoon was already invaded by peat-producing plants. Both the species named seemed to be of importance in the first stage of peat production and to play the same part here as *Phragmites* does in the formation of the Scandinavian bogs. On the mounds of *Sphagnum, Empetrum rubrum* Vahl. is abundant, generally together with the species of *Pseudocyphellaria* named above. Low shrubs of *Tepualia stipularis, Pernettya mucronata, Philesia buxifolia* and *Baccharis* sp. occur sparingly on these mounds, sometimes also *Blechnum pinnă-marina. Libocedrus tetragona* and dwarfed specimens of *Nothofagus betuloides* are far from common; the latter should, in all probability, be regarded as on the point of extinction.

Drosera uniflora and *Pinguicula antarctica* are met with on the sward-like beds of *Gaimardia*, as well as on those of *Sphagnum*. In places, *Tetroncium magellanicum* and *Schizæa australis* Gaud. form small groups, and *Myrteola nummularia* is common. *Carex microglochin* Wahl. var. *fuegina* Kükenth. and *magellanica* Lam., *Carpha schœnoides* Banks et Sol. and *Deschampsia kingii* are rather scarce. Of the phanerogamic plants enumerated as peculiar to the peat-bogs, only one, *Schœnodon chilensis*, and also the fern *Schizæa australis*, are absent from west Patagonia and Fuegia, although the latter may be found there, as it is known from the Falkland Islands.

From a morphological point of view the phanerogamic flora of the peat-bogs of the Guaitecas shows many similarities with that of the Scandinavian bogs. For instance, *Empetrum rubrum* exactly resembles in habit *Empetrum nigrum* L., and *Carex magellanica* is common to both districts. *Tetroncium magellanicum* has its morphological counterpart northwards in *Narthecium ossifragum* Huds., and *Myrteola nummularia* in *Oxycoccus palustris* Pers. But in many cases, naturally, such a correspondence does not exist. Thus *Eriophorum vaginatum* L., so common in Scandinavian bogs, has no morphological counterpart in the Patagonian, just as, vice versâ, *Donatia, Astelia, Oreobolus* and *Gaimardia* have none in the Scandinavian peat-bogs.

It now remains for me to give some account of the vegetation of the higher and treeless portions of these islands. They were once wooded, partly at least, but their trees have either been cut down or destroyed by fires. In places the forest is now regaining its lost ground.

These treeless slopes are covered with a carpet of mosses, as thick and unbroken as that of the ground in the beech forests just described. On the whole, the same species occur here as in the beech district, with an occasional solitary mound of *Sphagnum*. Thickets are common and consist of almost the same species as those forming the undergrowth in the beech forests, sometimes associated with that splendid fern, *Alsophila pruinata*, in considerable quantities. There are also less dense thickets made up exclusively or almost exclusively of *Lepidothamnus foncki* Phil., a very remarkable shrub belonging to the *Coniferæ* and scarcely reaching the height of one meter.

The vegetation of these slopes, in many respects, naturally reminds one of the undergrowth in the typical virgin forests, but, at the same time, it has some features in common with the flora of the peat-bogs. For example, *Drosera uniflora*, *Pinguicula antarctica*, *Astelia pumila*, *Gaimardia australis*, *Oreobolus obtusangulus*, *Myrteola nummularia*, *Blechnum pinnamarina* and *Schizæa australis* are met with in places, all of these belonging to the bog vegetation.

Certain spaces on these slopes are in the course of transformation into tree-bearing ground, *Libocedrus tetragona* taking possession almost exclusively. The beeches are probably far behind-hand, and may be at a disadvantage because their nuts are less adapted for transportation. At the time of my exploration of the Guaitecas Islands the groves of *Libocedrus* were about man-high. Judging from their quite considerable density and extension, it will appear that this species of conifer is of far greater importance here than in the southern section.

3. The Vegetation of the Rio Aysen Valley.

1. *The Community of Evergreen Beeches.*

At about 45° 23′ 30″ S. Lat. the Rio Aysen reaches the Pacific, having cut its way through the whole of the west Patagonian Cordillera. In the district around its mouth in the Firth of Aysen, which penetrates far into the mountain chain, the rainfall is evidently very much less than in the coast district and the islands. This is manifestly proved by the vegetation, as that compact carpeting of mosses, which is such a characteristic feature of the outer coast district, is entirely wanting here, which cannot otherwise be accounted for than by reason of the rainfall's being less in the Aysen valley than on the coast proper.

Although the plant growth of the lower and middle parts of the Aysen valley differs in some other respects also, besides the one just named, from that of the coast district, it must be regarded in a general way as belonging to the community of evergreen beeches. However, as I have pointed out, we are quite justified in setting apart the vegetation of this valley, and of others within the northern section of west Patagonia, as a separate section of the community of evergreen beeches. This part may appropriately be called the *Quila* formation. Even this is not uniform throughout and might therefore be further subdivided, the vegetation of the river-banks and islands, for instance, being very different from that of other parts of the valley. But such a subdivision of the vegetation of the Aysen valley into smaller sections I shall not now attempt, since it is not necessary for my present purpose.

A short journey up the river is sufficient to show how different its vegetation is from that of the coast district. It exhibits forms which could hardly be expected to occur here, and which agree better with the flora of a tropical country than with that of temperate regions. In particular, it contains two species, *Gunnera chilensis* Lam., and *Chusquea quila* Kunth, that remind one of the luxuriance and magnificence of the tropical floras, the former growing here and there in groups on the river bank, and extending as far up the river as the evergreen beeches. The flower stalks of the first of these plants, which resembles a species of *Rheum*, are more than man-high, the diameter of its rounded, lobed leaves frequently exceeding two meters. The *Chusquea* plays a dominant part in making up the undergrowth, and fills, almost uninterruptedly, the spaces between the trees of the park-like forest, forcing its way to the river banks in compact masses. It is a grass four to five meters high, with stalks standing close together, three to four centimeters thick and as hard as bamboo, forming a great impediment to the traveller's progress and, except in rare cases, necessitating the use of the axe. Of the density of the undergrowth the following will give a good idea. Our expedition[1] occupied seven weeks in going from the mouth of the Rio Aysen to the first steppes of the eastern slope of the Cordillera; of that time, about one week was lost through rain, the boat-journey up the river lasted three weeks, and it required just the same time to cut our way through the remaining twenty-five kilometers of forest. The journey back to the coast was done in five days, but could easily have been completed in less time.

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[1] The members of this expedition — which was sent out by the Chilian government for the delimitation of the frontier between Chili and Argentina, and the main object of which was to ascertain the interoceanic water-shed of the district around the sources of the Rio Aysen — were, in addition to myself, Dr. Hans Steffen, leader; Mr. De Fischer, Danish cartographer, and Messrs. Horn and von Bronsart Schellendorf, German officers. Besides, twenty-five Indians, of more or less pure breed, were employed as porters and pioneers.

Of the species of trees which characterize the forests of the lower and middle Aysen valley, *Nothofagus dombeyi* is decidedly the most important. *N. nitida* is of no great account here and is hardly to be found outside the district around the mouth of the river. Other trees occurring here are *Lomatia ferruginea, Laurelia aromatica*, *Eugenia* sp., *Caldcluvia paniculata*, *Drimys winteri*, *Embothrium coccineum*, *Podocarpus nubigena*, *Saxegothea conspicua* Lindl., *Weinmannia trichosperma* and *Edwardsia macnabiana*, the last of which appears to be restricted to the river banks. Rarely, and only on the islands and at the river side, occur *Nothofagus antarctica* and *N. pumilio*. Both, certainly, are only occasional guests here, their seeds doubtless having been carried down from the upper valley, where the deciduous beeches are at home. They are the only deciduous trees of that section of the Aysen valley, the flora of which we are considering.

The trees do not stand very close together and the light falling on the ground should presumably be sufficient for a comparatively rich undergrowth, were it not kept down by the *Chusquea* grasses. Where these grow most densely—which is especially the case on alluvial soil—almost all trace of other vegetation is wanting, the ground beneath its covering of fallen and faded *Chusquea* leaves and between their stalks being quite bare. In places where the ground is quite stony and where smaller streams rush or trickle down to the river, the *Chusquea* grass, as a rule, grows less closely and an undergrowth of bushes and herbs is to be found, though but poorly developed. On the other hand, the mosses in such places are often rich or even luxuriant. From time to time a falling tree kills some of the mighty *Chusquea* mounds and the clearings thus made are soon, though probably for only a short time, taken possession of by an undergrowth of shrubs, which is sometimes rather dense. The species composing it are the following: *Tecoma valdiviana*, *Cynoctomum pachyphyllum* Dcne, *Dacostea ruscifolia* Clos, *Azara lanceolata* Hook. fil., *Daphne pillopillo* Gay., *Philesia buxifolia* and *Senecio cymosus* Remy, the three last named of which were found only once. The herbaceous vegetation is likewise not rich in species, consisting only of *Nertera depressa*, *Urtica magellanica* Poir., *Pilea elliptica* Hook. fil., *Uncinia phleoides*, *Rubus geoides* Sm., and *Osmorhiza berterii.* Of ferns I should mention *Phegopteris spectabilis* Fée, *Aspidium orbiculatum* Desv. and *A. multifidum* Mett., *Blechnum pinna-marina* and *B. chilense* and *Alsophila pruinata*, all of them rare.

The vegetation of epiphytic phanerogams includes three species, *Mitraria coccinea*, *Asteranthera chiloensis* and *Luzuriaga radicans*, all very common. Of parasitic plants I noticed only *Myzodendron punctulatum* and *M. oblongifolium* DC. Particularly interesting is the occurrence of lianas in these forests, although they have only one representative here, *Hydrangea scandens* Poepp., the most powerful liana of Chili and western Patagonia. It is one of the most ornamental plants of the landscape and where, as is often the case, it covers the broken trunks in profusion, it offers an attractive sight with its rich display of clusters of white flowers.

Only on the islands and river banks is a more luxuriant vegetation to be found. *Fuchsia magellanica*, *Escallonia macrostemma*, *Aristotelia magni* L'Her. and *Tepualia stipularis* here grow in dense, almost impenetrable thickets. The vegetation of herbs is rich in species, owing to a steady migration of plants from the upper courses of the river. The seeds are carried along by the current and deposited on the banks and islands, but these immigrant plants would soon be eliminated from the strand flora by the annual overflowing of the river and the deposition of its sediments, if there were not a constant supply of fresh individuals always coming down. In a similar way have been added a few representatives of the Alpine flora of the mountains surrounding the valley. In the following list of the most important elements of the flora of the river banks and islands those species which have migrated from the district of the deciduous beeches are marked thus * and those from the Alpine flora thus * *.

Pernettya mucronata Gaud.
furens Klotzsch.
Baccharis palenæ Phil.
* *Colletia spinosa* Lam.
* *Discaria discolor* (Hook.).
Tepualia stipularis Gris.
Aristotelia magni L'Her.
Pseudopanax lætevirens (Gay.).
Maytenus magellanica (Lam.) Hook.
Ribes sp. (probably *R. magellanicum* Poir.).
* * *Senecio trifurcatus* Less.
* *danyausii* Hombr. et Jacq.
* *argenteus* Kze.
* *dusenii* O. Hoffm. sp. nov.
otites Kze.
Gnaphalium pratense Phil.
* *Mutisia retusa* Remy.
* *Nassauvia dusenii* O. Hoffm. sp. nov.

* _Solidago chilensis_ Meyen.
* * _Lagenophora nudicaulis_ (Comm.).
* * _Perezia magellanica_ (Linn. fil.) Lag.
* _Madia sativa_ Mol.
* _Heterothalamus nivalis_ (Schultz Bip.) Wedd.
* _Haplopappus coronopifolius_ DC.
Sonchus fallax Wallr.
* _Erigeron sordidus_ Gill.
* _Hypochœris arenaria_ Gaud.
Valeriana lapathifolia Vahl.
virescens Clos.
* _Galium aparine_ L.
* _Galium relbun_ Endl.
* _Limosella aquatica_ L.
Calceolaria tenella Poepp. et Endl.
* _Lathyrus magellanicus_ Lam.
* _Geum magellanicum_ Comm.
* _Fragaria chilensis_ Ehrh.
* _Acæna adscendens_ Vahl.
* _pinnatifida_ Ruiz et Pav.
* _splendens_ Hook. et Arn.
ovalifolia Ruiz et Pav.
* _lævigata_ Ait.
Crassula paludosa (Schltd.).
Cardamine ovata Phil.
* _Anemone multifida_ Poir.
Ranunculus chilensis DC.
peduncularis Sm.
obtusatus Poepp.
Stellaria cuspidata Willd.
* _Arenaria serpylloides_ Naud. _andicola_ Gill.
* _Rumex decumbens_ Dusén.
Libertia elegans Poepp.
Codonorchis lessonii (d'Urv.) Lindl.
* _Urtica magellanica_ Poir.
* _Cerastium arvense_ L.
* * _Marsipospermum grandiflorum_ (Linn. fil.) Hook.
Juncus stipulatus Nees et Meyen.
lesueurii Bol.
procerus Meyer.
bufonius L.
* _Luzula racemosa_ Desv.
Heleocharis melanostachys (d'Urv.).
Scirpus cernuus Vahl.
* _Carex filiformis_ L. subsp. _æmatorhyncha_ Desv., f. _gracilis_.
pseudocyperus L. subsp. _haenkeana_ Presl.
darwinii Boott var. _robustior_ Kükenth.
* _decidua_ Boott.
Fuchsia magellanica Lam.
Berberis darwinii Hook.
* _microphylla_ Forst.
* _empetrifolia_ Lam.
* _Escallonia rubra_ Pers.
stricta Remy.
macrantha Hook. et Arn.
Raphithamnus cyanocarpus Miers.
Veronica fonkii Phil. (in the district around the mouth of the river).
* _Calceolaria darwinii_ Benth.
Veronica peregrina L.
Mimulus lutens L.
* _Phacelia circinata_ Jacq.
* _Collomia gracilis_ Dougl.
* * _Pernettya leucocarpa_ Phil.
* _Azorella trifurcata_ (Gaerth) Hook.
* _Mulinum spinosum_ Pers.
* _Osmorhiza berterii_ DC.
Apium graveolens L.
* _Myriophyllum verticillatum_ L.
Gunnera magellanica Lam.
chilensis Lam.
Epilobium glaucum Hanskn. et Phil.
* _Œnothera stricta_ Ledeb.
Viola maculata Cav.
* _Empetrum rubrum_ Vahl.
* _Geranium magellanicum_ Hook. fil.
* _Astragalus brevicaulis_ Dusén.
* _Adesmia_ (_Patagonium_) _boronioides_ Hook. fil.
* _retusa_ Gris.
Vicia patagonica Hook. fil.
daropskyana Phil.
* _Alopecurus alpinus_ Sm.
* _Phleum alpinum_ L.
* _Agrostis montevidensis_ Spr. var. _submutica_ Doell.
* _Calamagrostis stricta_ Beauv.
* _Deschampsia flexuosa_ (L.) Trin.
kingii (Hook. fil.) Desv.

Deschampsia aciphylla (Franch.) Speg.
* *Trisetum subspicatum* Beauv. var. *glabrifolium* Hook.
* *Cortaderia pilosa* (d'Urv.) Hack.
*   *araucana* Stapf.
* *Poa nemoralis* L. var. *magellanica* Hack.
* *Poa scaberula* Hook. fil.
    fuegiana (Hook. fil.) Hack.
Glyceria fluitans R. Br. var. *stricta* Desv.
* *Festuca purpurascens* Banks et Sol.
* *Bromus catharticus* Mol.
*   *albowianus* Kurtz.
* *Hordeum comosum* Presl.
*   *secalinum* Schreb. var. *chilense* Desv.
Equisetum bogotense H.B.K.
Mertensia cryptocarpa Fée.

It is true that some of the species here indicated as immigrants, were not found either in the district of deciduous beeches, or on the steppes, but as I observed that they grew sparsely and only in the upper part of the section of the valley now in question, I think there is no doubt of their migration. Such species are: *Senecio dusenii*, *Nassauvia dusenii*, *Haplopappus coronopifolius*, *Arenaria serpylloides* var. *andicola*, *Rumex decumbens*, *Cortaderia araucana* and *Poa scaberula*, all of which, except the last, presumably have their home in the western section of the steppe district. Very likely the number of species carried down by the river is actually greater than I have given in the above list.

In the *Quila*-formation the mosses do not rank nearly so high as in the coast district and, on the whole, the moss-flora of the Aysen valley differs largely from that of the coast, this being true especially of the Musci proper. So far as the *Hepaticæ* are concerned, the disparity is not quite so marked, not a few species being common to both districts. Nevertheless, those species characteristic of the coast are wanting in the valley, and if one or other of them is occasionally found, it is always sparingly, so that they never play an important part here. Besides this, *Hepaticæ*, with a few exceptions, occur in comparatively small numbers, Musci taking the lead both in species and individuals.

Of epiphytic *Hepaticæ* the following are of importance: *Plagiochila rufescens* Steph., *P. bispinosa* Ldbg., *P. uncialis* and *P. flexicaulis*, only the last named occurring numerously now and then; further *Lophocolea conifolia* Steph., *L. fulvella*, *L. gayana*, *L. humilis*, *L. irregularis* Steph., *L. cucullistipula* Steph. and *L. navicularis* Steph., of which the last two are the commonest and have the widest range. *Chiloscyphus paraphyllinus* Steph., *Trichocolea verticillata*, *Radula plumosa* and *R. tenera*, *Madotheca recurva* Tayl. and *M. gracilenta* Tayl., these last two being common and often plentiful; *Frullania boveana* Mass. and *F. lobulata*

Hook., besides the epiphyllic *Cololejeunea asperrima* Steph. and *Eulejeunea patagonica* Steph.

Among the epiphytic Musci some are conspicuous by their not uncommon occurrence in large masses, such being *Pilotrichella cumingii* and the magnificent *Cyathophorum splendidissimum* (Mont.) Hpe. et Lor. These and a few others of the mosses of the Aysen valley belong to genera which have their proper home in the Tropics. Of some importance also are *Hookeria ancistroides* Mont., *Neckera chilensis* Schpr., *Ptychomnium ptychocarpum* (Schwaegr.) Mitt., *Cryphæa consimilis* Mont., *Rigodium nano-fasciculatum* C. Müll., *Dicranum capillifolium* Broth. sp. nov., *Ectropothecium spirifolium* sp. nov., *Daltonia krauseana* C. Müll. and *D. affinis* sp. nov., *Barbula crispatula* C. Müll. and *B. flagellaris* Schpr., *Eriopus odontoloma* sp. nov., *Orthotrichum nigritellum* sp. nov., *Cladomnium gracile* (Hpe.) Mitt., *Ulota fulvella* Mitt. and *U. macrodonta* sp. nov., *Amphidium cyathicarpum* (Mont.) Jaeg., *Pentastichella pentasticha* (Mont.) C. Müll., *Lepyrodon implexus* (Kze.) Par. and *L. lagurus* (Hook.) Mitt., *Eriodon conostomus* Mont. and *Rhaphidostegium polytrichadelphus* sp. nov., the last named living on *Pogonatum dendroides.*

On decaying trunks Musci are poorly represented, while *Hepaticæ* are here comparatively rich in species. Of the former *Rhaphidostegium callidum* (Mont.) Jaeg. and *Acrocladium auriculatum* Mitt. are the foremost, being the only ones which occur *en masse*, at least within the forest proper. On stones by the river and particularly on trunks fallen or stranded on its banks, provided they are placed below high-water mark, *Dendrocryphæa gorveana* (Mont.) Par. et Schpr. also occurs in very large numbers. *Scouleria patagonica* (Mitt.) Jaeg., likewise abundant, lives in the same way, although it prefers the stones; this species, by the way, being replaced on the stones higher up the river by large masses of *Sciaromium confluens* (C. Müll.) Par.

Of *Hepaticæ* living on decaying logs I may name *Aneura autoica* Steph. and *A. pulvinata* Steph., *Lophozea dusenii* Steph., *Lophoçolea attenuata* Steph., *L. lacerata* Steph., *L. leptantha* Tayl., *L. microstipula* Steph. and *L. otiphylla*, *Cephalozia trisetosa* Steph., *Schistochila reicheana* and *S. stratosa* Mont., *Lepidozia lævifolia* Tayl. and *L. chordulifera* De Not. and *Jungermannia pigafettoana* Mass., of which only the last occurs in considerable masses.

The ground is rich enough in Musci, but *Hepaticæ* are scarce. A regular carpeting of mosses, composed of loosely woven species, is not uncommonly to be found in places where, for one cause or other, the *Chusquea* grasses are receding. The moss vegetation is likewise rich on the affluents of the main river, especially where they trickle down through stony and well-shaded ground. Of *Hepaticæ* hardly more than two species, and only in extremely rare cases, occur in considerable numbers; namely, *Plagiochila latifrons* Hpe. et Gottsche, and *Chiloscyphus striatellus*, the latter also growing epiphytically on *Hymenophyllaceæ* and *Pogonatum dendroides*.

In the following list of some of the more important *Hepaticæ* and Musci I have included some species which grow on rocks and stones, denoting them with an appended (r) *Hepaticæ: Cryptomitrium tenerum* (Hook.) Aust., *Symphyogyna circinata* N. et M. and *S. hochstetteri* N. et M., *Jamesoniella colorata*, *Tylimanthus fendleri* Steph. and *T. viridis* Mitt., *Plagiochila gayana* Gottsche, *P. longissima* and *P. tristis* Steph. (r), *Lophocolea campanulata* Steph. (r), *L. gottscheæoides* and *L. triseriata* Steph., *Alobiella dusenii* Steph. (r), *Isotachis anceps* (r), *Schisma dura* Steph. (r), *Lepicolea ochroleuca* and *L. quadrilaciniata* (Sull.) (r), *Mastigophora antarctica* Steph. (r), *Schistochila spegazziniana* (Mass.) (r), and *Balantiopsis chilensis*.

Musci: Rigodium toxarion and *Thamnium arbusculans*, both common and massed together, *Brentelia chilensis* Lor., occasionally plentiful and forming mats along brooklets; *Brentelia harotiana* Besch., *B. brachycoma* Besch. and *B. sublongata* Broth. sp. nov., *Rigodium carnosulum* sp. nov. and *R. pseudo-thuidium* sp. nov., *Brachythecium cuspidarioides* sp. nov., *Bartramia magellanica* Aongstr. (r), *Bartramidula exigua* (Sull.) Jaeg., *Dicranum nigricaule* and *D. billardieri*, *Hypopterygium didictyon* and *H. thouinii*, *Acroschisma wilsoni* Hook. fil. et Wils. (r), *Leptotheca spegazziniana* C. Müll. (r), *Rhacomitrium subnigritum* sp. nov. and *R. flavopallidum* sp. nov., *Bryum steffeni* sp. nov., *B. brevigemmatum* sp. nov. and *B. timmiæcaulon* sp. nov., *Leptobryum pyriforme* (Hedw.) Schpr., *Eustichia longirostris* (Brid.) C. Müll. (r), *Hypnodendron krausei*, *Isothecium serpens* sp. nov., *Ditrichum conicum* (Mont.) Par., *Pogonatum dendroides*, *Pseudoleskea fuegiana* Besch., *Catagonium politum* (Hook. fil. and Wils.) Mitt., *Ptychomnium cygnisetum*, *Blindia contecta* C. Müll. (r) and *B. globularis* sp. nov. (r), *Webera cruda* (L.) Schwaegr. and *W. alticaulis* (C. Müll.) Par., *Barbula robusta* (Hook. et Grev.) Brid. (r) and *B. flavido-pilosa* sp. nov. (r), *Pterygophyllum obscurum* (Mont.) Mitt. and *Cladomnium crenato-obtusum* sp. nov. (r).

The vegetation of lichens is not rich, save that in the vicinity of the mouth of the river it reminds one, in some degree, of the abundance of lichens along the beach of the islands, *Stictaceæ*, as usual, being well to the front. The following species are deserving of notice: *Sticta longipes* (Müll. Arg.) Malme, *S. caulescens* and *S. damæcornis* (Sw.) Ach., *Pseudocyphellaria faveolata* (Del.) Malme, var. *cervicornis* (Flot.), *P. intricata* (Del.), *P. wainio*, var. *thouarsii* Del. and *P. physciospora* (Nyl.) Malme. *Nephroma antarcticum*, *Sphærophorus compressus* and *Stereocaulon ramulosum.*

II. THE COMMUNITY OF DECIDUOUS BEECHES.

About forty-five kilometers above the mouth of the Rio Aysen a complete change takes place in the vegetation, the evergreen beeches and their accompanying species rapidly disappearing, and a new community of plants, that of the deciduous beeches, very dissimilar to the preceding, taking their place. Almost suddenly the twilight of the *Chusquea*-grass and dense foliage of the evergreen beeches is succeeded by an open and bright landscape, where the pioneers may cease their now unnecessary work and the road is free in almost every direction, without risk of serious impediment. Here also the ground is covered by a beautiful park-like forest, although quite differently composed and with quite another undergrowth, as compared with the one previously described. Already attractive from its rich vegetation, this new district becomes still more so from the sharp contrast that its community of plants offers to the one which we have now left behind us.

Nature has endowed this region richly, almost profusely. Its vegetation is simply luxuriant and in the park-like forest one wades through grasses and other herbs reaching as high as one's waist, this luxuriance being partly explained by a deep layer of rich humus; a virgin soil that up to the time of our expedition had probably never been trod by human foot.

The park-like forest is comparatively thin and almost exclusively composed of the deciduous beech, *Nothofagus antarctica*, which does not stand in such dense order of growth as its European cousin, *Fagus sylvatica* L. A solitary specimen of *Nothofagus pumilio* may be occasionally encountered.

The light in these forests is stronger than in the beech forests of Europe, not only by reason of the trees not standing very close together, but also because, as a rule, one or other of their main branches is withered. Evidently, this cannot be due to fire, nor does it appear to be caused by the ravages of parasites in excessive numbers, whether species of *Myzodendron* or parasitical fungi; the reason is unknown.

The bright light prevailing in these forests and the fertility of the soil sufficiently explain their rich undergrowth, so extremely different from that of the beech forests of northern Europe, which also grow on humus. The difference may be illustrated by a few comparisons. Among other features of the beech forests of northern Europe are the following: the undergrowth is very sparse and poor in species, the ground being nearly bare of vegetation and strewn with fallen leaves and involucres; shrubs are wanting, while spring flowers are common, likewise plants with underground stems, not rarely consisting of a creeping rhizome; the great majority of plants are perennial; saprophytic plants occur; mosses and lichens are almost entirely wanting. In nearly all these respects the beech forests of the upper Aysen valley are different. A vegetation of shrubs occurs, though it is but poorly developed; the flora is not particularly rich in species, but the vegetation is dense; the ground is nowhere bare of plants; of spring flowers there are none, except some species of *Berberis* and *Ribes*, which should perhaps be counted as such; most species flower in summer and the beginning of autumn; bulbous and saprophytic plants are wanting; the number of annual and perennial species is about the same as in Europe; mosses do not grow on the ground, but sometimes plentifully on the tree-trunks; the vegetation of lichens, sometimes abundant, consists of only a single species, *Letharia poeppigii* (Nees et Flot), other species being few and rare.

Of plants composing the undergrowth, some are conspicuous by their occurrence in large masses, such as *Galium aparine*, extremely common and forming quite a network on the top of the other vegetation; *Vicia daropskyana*, plentiful; *Mutisia retusa*, sometimes abundant; *Acæna ovalifolia*, common, even abundant here and there; *Osmorhiza berterii*, plentiful; *Calceolaria darwinii*, *Uncinia phleoides* and *Carex filiformis* subsp.

æmatorhyncha f. *gracilis*, plentiful here and there. Of grasses, *Bromus catharticus* and *Elymus albowianus* are predominant.

Subjoined is a list of species composing the undergrowth:

- *Berberis microphylla* Forst.
  - *darwinii* Hook.
  - *ilicifolia* Linn. fil.
- *Galium aparine* L.
  - *fuegianum* Lam.
- *Vicia doropskyana* Phil.
- *Lathyrus magellanicus* Lam.
- *Mutisia retusa* Remy.
  - *decurrens* Cav.
- *Solidago chilensis* Meyen.
- *Leuceria* sp.
- *Adenocaulon chilense* Less.
- *Cerastium arvense* L.
- *Stellaria cuspidata* Willd.
- *Fragaria chilensis* Ehrh.
- *Acæna ovalifolia* Ruiz et Pav.
- *Osmorhiza berterii* DC.
- *Ribes cucullatum* Hook. et Arn.
  - sp. (probably *R. magellanicum* Poir.).
- *Geranium magellanicum* Hook. fil.
- *Geum magellanicum* Comm.
- *Calceolaria darwinii* Benth.
- *Uncinia phleoides* Pers.
- *Carex filiformis*, subsp. *æmatorhyncha*, f. *gracilis*.
- *Alopecurus alpinus* Sm.
- *Trisetum subspicatum* Beauv.
- *Deschampsia flexuosa* (L.) Trin.
- *Bromus catharticus* Mol.
- *Elymus albowianus* Kurtz.
- *Blechnum pinna-marina* (Poir.).
- *Polystichum elegans* Remy.

On the trunks of the trees are only a few species of mosses generally massed together, namely, *Zygodon gracillimus* and *Z. curvicaulis*, *Brachythecium sericeo-nitens* sp. nov. and *Barbula flagellaris*, in addition to a single representative of the *Hepaticæ*, *Lophocolea cucullistipula*. I have already referred to the lichens.

The space occupied by the community of deciduous beeches is not altogether continuous, because, as already mentioned, there are small steppes within the forest, of one or two kilometers in extent, which are found even very far to the west. The boundary between these steppes and the encircling forest is, as a rule, sharply defined, but sometimes there is an intermediate belt of very dense thickets of *Berberis microphylla*. The fact that the beech-nuts never spread very far from the mother-tree might account for this well-defined boundary between the forest and the steppe.

III. THE STEPPE DISTRICT.

1. The Small Steppes.

The vegetation of the large steppe district to the eastward of the Aysen valley I know only through my exploration of the small isolated steppes within the forest. That, on the whole, their vegetation gives a correct idea of the steppe proper, I infer from the fact that nearly all of the species composing it are also found in the district of Nahuel-huapi, which is genuine steppe land, large and unbroken; though the flora of these smaller steppes necessarily shows considerably fewer species than occur farther eastward. By including those species also which are found on the steppe-like slopes of the surrounding mountain heights, at an altitude of 700 to 1000 meters above the sea, this disproportion is somewhat reduced. It is a matter of course that the smaller steppes, being entirely level and with a perfectly homogeneous soil, cannot furnish so many species as the wide Patagonian steppe, with its diversity of soil and surface, and offering far more favorable conditions for the growth of a rich and varied flora.

On the small steppes now in question grasses predominate, their foremost representative being *Festuca gracillima*, which grows in small tufts. Shrubs are remarkably few and scarce. Of tuberous plants there is only one, belonging to the the family of the Orchids, which was found in a withered state and was therefore not determinable. The number of annual and perennial species is about the same. The vegetation is scanty.

LIST OF SPECIES.

Berberis microphylla Forst.
  empetrifolia Lam.
Ribes cucullatum Hook. et Arn.
Baccharis magellanica (Lam.) Pers.
Erigeron sordidus Gill.
Solidago chilensis Less.
Hypochœris poeppigii (DC.).
Madia sativa Mol.
Senecio danyausii Hombr. et Jacq.
  argenteus Kze.
Perezia linearis Less.
Cerastium arvense L.
Geranium magellanicum Hook. fil.
Acæna multifida Hook. fil.
  splendens Hook. et Arn.
Fragaria chiloensis (L.) Ehrh.
Anemone multifida Poir.
Collomia gracilis Dougl.
Thlaspi magellanicum Comm.
Armeria chilensis Boiss. var. *magellanica* Boiss.
Quinchamalium sp.
Loasa volubilis Juss.
Sisyrinchium chilense Hook.
Susarium segethi Phil.
Luzula racemosa Desv.
Carex gayana Desv. var. *densa* Kükn.
Alopecurus alpinus Sm.
Phleum alpinum L.
Deschampsia flexuosa (L.) Trin.
Agrostis montevidensis Spr. var. *submutica* Doell.
Festuca gracillima Hook. fil.
Trisetum subspicatum Beauv.
Poa fuegiana (Hook. fil.) Hack.

One or two species of *Orthotrichum* and one of *Usnea*, somewhat resembling *U. barbata*, are found on the older *Berberis* shrubs, but apart from these, there is no vegetation of mosses or lichens in these small steppes.

2. The Mountain Flora of the Upper Aysen Valley.

A brief account of the vegetation of the mountains surrounding the rather wide upper valley of the Aysen should not be omitted in this connection, although my knowledge of it is not very comprehensive, being founded only on my observations during a single ascent to the higher and bare parts of one of these mountains.

Their flora is rather diversified and their sides up to an altitude of 700 meters are covered with extremely dense thickets and park-like forest. Above the 700-meter-line the vegetation becomes more like that of the steppe, having much in common with the flora of the treeless areas in the valley and interspersed with small groves of *Nothofagus pumilio* up to an elevation of 1000 meters. This tree extends upward to an altitude of 1300 meters, continually decreasing in size, and becoming a mere bush and growing in low thickets near the upper limit of its range. It is accompanied by a vegetation which is very much poorer in species than that of the lower and steppe-like slopes, and differently composed. Above the 1300-meter-line the vegetation is extremely thin, with very few species, and at 1400 meters every trace of plant-life disappears.

The excessively dense and almost impassable thickets of the lower slopes are made up of the following species: *Berberis microphylla* and *B. darwinii*, *Ribes* sp. (presumably *R. magellanicum* and *R. cucullatum*), *Discaria discolor*, *Pernettya mucronata*, *Colletia spinosa*, *Rhacoma disticha*, *Escallonia rubra*, with a sprinkling of herbaceous plants, such as *Viola maculata*, *Vicia daropskyana*, *Elymus albowianus*, *Deschampsia flexuosa* and *Mutisia retusa*, the last named of which is often plentiful, the others being very scarce.

Here and there small beech groves are interposed between the thickets. At a height of from 500 to 600 meters I met with one grove that quite unexpectedly turned out to be composed of *Nothofagus betuloides*, which species I could hardly have believed to exist in these dry areas. The undergrowth of the grove was made up exclusively of *Rhacoma disticha*.

During my ascent the last park-like forest was found at an altitude of 700 meters. It was as vigorous as the forests of the valley and fully typical, although *Nothofagus pumilio* preponderated. The undergrowth was the same as in the valley and, in addition, the following three species were found: *Embothrium coccineum*, *Rhacoma disticha* and *Cystopteris fragilis*.

The flora of the steppe-like slopes above is partly composed of the same species as I have already stated to occur in the small steppes of the valley. But as, in addition, it shows many species which I did not find in the latter, I subjoin a complete list of species. It is as follows:

- *Baccharis magellanica* (Lam.) Pers.
- *Chiliotrichium diffusum* (Forst.).
- *Pernettya mucronata* (Linn. fil.) Gaud.
- *Escallonia rubra* Pers.
- *Senecio argenteus* Kze.
    - *chilensis* Less.
    - *andersoni* Hook. fil.
- *Erigeron sordidus* Gill.
- *Hypochœris poeppigii* (DC.).
    - *arenaria* Gaud.
- *Perezia linearis* Less.
- *Gnaphalium serpyllifolium* Remy.
- *Hieracium chilense* Less.
- *Saxifraga cordillerarum* Presl. var. *magellanica* (Poir).
- *Mulinum spinosum* (Pers.).
- *Daucus australis* Poepp.
- *Anemone multifida* Poir.
- *Acæna multifida* Hook. fil.
    - *elegans* Phil.
- *Fragaria chilensis* (L.) Ehrh.
- *Empetrum rubrum* Vahl.
- *Melandrium magellanicum* (Lam.) Fenzl.
- *Oxalis laciniata* Cav.
- *Viola maculata* Cav.
- *Discaria discolor* (Hook.).
- *Rhacoma disticha* (Hook.) fil.
- *Berberis microphylla* Forst.
- *Wendtia reynoldsi* Endl.
- *Armeria chilensis* Boiss. var. *magellanica* Boiss.
- *Cerastium arvense* L.
- *Lathyrus magellanicus* Lam.
- *Phacelia circinata* Jacq.
- *Calceolaria biflora* Lam.
- *Valeriana carnosa* Sm.
- *Loasa volubilis* Juss.
- *Thlaspi magellanicum* Comm.
- *Sisyrinchium chilense* Hook.
- *Luzula racemosa* Desv.
- *Phleum alpinum* L.
- *Trisetum subspicatum* Beauv.
- *Poa fuegiana* (Hook. fil.) Hack.
- *Deschampsia flexuosa* (L.) Trin.
- *Festuca gracillima* Hook. fil.
- *Aira montividensis* Spr. var. *submutica* Doell.
- *Cortaderia pilosa* (d'Urv.).

In some places these steppe-like slopes are studded with small groves, consisting exclusively of *Nothofagus pumilio*, *N. antarctica* having now disappeared. The ground beneath is sometimes fairly well covered with mosses, the following species of which are conspicuous: *Brachythecium paradoxum* (Hook. fil. et Wils.) Besch., *B. morenoi* C. Müll., *Bryum hamatum* sp nov., *Acrocladium auriculatum* (Mon.) Mitt., *Campylopus laniger* Besch., *Plagiothecium lepto-plumosum* Dusén and *Catagonium politum* (Hook. fil. et Wils.) E. Müll.

Even at an altitude of 800 to 900 meters *Nothofagus pumilio* is only a low tree, the lower branches of which do not permit one to pass beneath them. The greater the altitude at which it is found, the shorter it is, forming at the upper limit of its range (1300 meters above sea-level) a very stunted forest of dwarfed trees, the horizontal branches of which are intertwined with one another. *Nothofagus pumilio* therefore differs in no way as to habit from *N. antarctica*, the dwarfed growth of which at high altitudes I have already described.

At this height *Nothofagus pumilio* is accompanied by a very scanty vegetation which is quite different from that of the steppe, all grasses except *Poa fuegiana* having disappeared. Large areas are entirely bare of plants, and boisterous winds often make a clean sweep. Only on the leeward (here the eastern) side of the thickets does the sand remain in patches, and only here can the more delicate species hold their own in their severe struggle for existence. On such a patch of sand I noticed the following species, growing quite closely together when near the thicket, but elsewhere scattered at rather wide intervals.

Ribes cucullatum Hook. et Arn.
Pernettya mucronata (Linn. fil.) Gaud.
    leucocarpa DC.
Berberis empetrifolia Lam.
Empetrum rubrum Vahl.
Rubus geoides Sm.
Chiliotrichium diffusum (Forst.).
Senecio chilensis Less.
    triodon Phil.
Hypochæris arenaria Gaud.
Perezia pediculariæfolia Less.
Perezia linearis Less.
Leuceria salina (Remy).
Acæna pearcei Phil.
    leptacantha Phil.
Azorella lycopodioides Gaud.
Cerastium arvense L.
Thlaspi magellanicum Comm.
Armeria chilensis Boiss. var. *magellanica* Boiss.
Valeriana foncki Phil.
Luzula racemosa Desv.
Poa fuegiana (Hook. fil.) Hack.

Still higher up the vegetation is extremely poor and sparse. Up to an altitude of 1300 meters I saw the few following species:

Chiliotrichium diffusum (Forst.).
Nassauvia serpens d'Urv.
Senecio purpuratus Phil.
    chilensis Less.
Acæna leptacantha Phil.
Draba magellanica Lam.
Armeria chilensis Boiss. var. *magellanica* Boiss.
Oxalis laciniata Cav.
Luzula racemosa Desv.
Poa fuegiana (Hook. fil.) Hack.

At an elevation of 1400 meters I found only one plant, a lichen, *Neuropogon trachycarpus* Stirl. Above that height the slopes were entirely denuded of vegetation.

The flora of the Alpine region of the western Patagonian Cordillera is, on the whole, still unknown. Omitting the Alpine and marine floras, the western Patagonian vegetation, taken as a whole, may be said to consist of only the three communities of plants which I have attempted in some measure to describe.

The community of evergreen beeches occupies a narrow, but very long strip of land on the western side of the Cordillera. In the south it expands over the western and southwestern portions of the Magellan district, reaching its southern limit only at Cape Horn. Northward, it extends through the whole of southern Chili, its total range north and south comprising no less than 18 degrees of latitude, equal to about 2000 kilometers, or 1200 English miles.

The space occupied by the community of deciduous beeches on the western side of the Cordillera is far less extensive. At its southernmost point, on or near the Straits of Magellan, it is not quite homogeneous, but is intermingled with some intruders from the community of evergreen beeches, which here unexpectedly extend far eastward. In the southern part of Fuegia also, at least along the eastern section of the Beagle Channel, both of these communities are intermingled, though even here, between the Rio Grande and the large firth-like lake, Lago Fagnano, the former is quite typical. Farther north and already in northern Patagonia, the character of this community of plants is somewhat modified by the accession of new elements, the most important being *Libocedrus chilensis* Endl., though to what extent, I was not in a position to determine.

The steppe vegetation, on the whole, is very uniform throughout the entire length of the area which it occupies. In northern Patagonia this area is evidently very narrow, but towards the south it expands more and more, extending in Fuegia, and probably in southern Patagonia also, quite to the Atlantic coast. Many species range over the whole of the Patagonian steppe, extending also to the Fuegian. To give one instance only, *Festuca gracillima*, which is so characteristic of the small steppes in the upper Aysen valley, is quite as much at home in large sections of the Fuegian steppe and likewise in the Patagonian, as in the district around Lago Nahuel-huapi.

In the foregoing account of the vegetation of west Patagonia I have occupied myself only with the three plant-communities mentioned. This is not because there are no others represented here, but only because these others are of very secondary importance and in no way comparable to the three dominant plant communities described.

ERRATA AND EMENDATIONS IN PART I.

Page 5, footnote 1, line 1, 2, for Aufenthalt read Aufenthalts.

Page 7, line 11, for *endivæfolius* read *endiviæfolius*.

Page 7, line 23, for *Senecio smithii* DC., read *Senecio acanthifolius* Hombr. et Jacq.

Page 7, line 25, for *Marsipospermum* read *Marsippospermum* (the same also in p. 10, line 5, and p. 22, line 9 from foot).

Page 8, line 23, for *Fuchsia coccinea* Ait. read *Fuchsia magellanica* Lam.

Page 8, line 28, for (Mant.) read (Mont.).

Page 8, line 29, for *orymæa* read *orygmæa* (bis).

Page 9, line 14, for *betuloides* read *antarctica*.

Page 10, line 5, for *bifurcatus* read *trifurcatus*.

Page 12, line 22, for *Dacostea* read *Decostea* (the same also at p. 14, line 2; p. 15, line 23; p. 20, line 3 from foot).

Page 13, line 7, for *Brentelia* read *Breutelia*.

Page 13, line 12, for *anomada* read *anomoda*.

Page 14, line 12, for *P. urvillei* read subsp. *urvillei*.

Page 15, line 9, *Myrtus ugni*, the author uses *Ugni Molinæ*.

Page 19, footnote, for von Bronsart Schellendorf read Bronsart von Schellendorf.

Page 20, line 4 from foot, for *Cynoctomum* read *Cynoctonum*.

Page 21, line 17, for *magni* read *maqui*; the same 3 lines from foot.

Page 22, line 19 of 2d column, for *lutens* read *luteus*.

Page 22, line 22 of 2d column, for Phil. read DC.

Page 22, line 23 of 2d column, for (Gaerth.) read (Gaertn.).

Page 22, line 30 of 2d column, for Hanskn. read Hauskn.

Page 22, line 8 from foot, for *daropskyana* read *darapskyana* (similarly for p. 27, line 3 from foot; p. 28, line 9; p. 30, line 13 from foot.

Page 23, line 3 of 1st column, for Hook. read Hack.

Page 24, line 12, for *Barbula crispatula* read *Calyptrogon crispatulus* (C. Müll.) Broth.

Page 24, line 6 from foot, for *Lophozea* read *Lophozia*.

Page 25, lines 23, 24, 25, for *Brentelia* read *Breutelia*; for *harotiana* read *hariotiana*, and for *sublongata* read *subelongata*.

Page 25, line 3 from foot, for Mitt. read C. Müll.

Page 26, line 10, for *P. wainio* read Wainio.

Page 29, line 6 from foot, for *chiloensis* read *chilensis*.

Page 31, line 26, 2d column, for *montividensis* read *montevidensis*.

Page 31, line 27, 2d column, after d'Urv. add Hack.

Page 31, line 8 from foot, for (Mon.) read (Mont.).

Page 31, line 6 from foot, for E. Müll. read C. Müll.

Page 32, line 7 from foot, for Stirl. read Stirt.

(N. B. It should be observed that it was impracticable for the author to revise the proofs.—Ed.)

HEPATICÆ COLLECTED IN SOUTHERN PATAGONIA.

BY

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(PLATES IV, V, VI.)

THE territory of Patagonia, and particularly the regions neighboring the Straits of Magellan, have several times been visited by scientific expeditions. Most of these have made collections of Patagonian plants and have included the hepaticæ among them, either incidentally or systematically. Our knowledge of the hepatic flora of this remote country is, therefore, sufficient to give us some idea of its exceeding richness and variety. Although a few of the most conspicuous species were gathered in the first years of the present century and even earlier, the real foundations of our knowledge are based on the collections made during the Antarctic voyage of the British ships *Erebus* and *Terror*, in the years 1839–43. These important collections were studied by Sir Joseph D. Hooker and Dr. Thomas Taylor, and their preliminary account[1] of the species found was later amplified into a fuller description[2] accompanied by numerous colored figures.

Passing over several smaller gatherings, attention may further be called to three larger collections, which have been made and described within recent years. The first of these collections was that of Dr. Spegazzini, which was made in 1882 and included 103 species, most of which came from Fuegia. The determinations were by Professor Massalongo, of Ferrara, who published an illustrated account[1] of the species collected, describing 27 as new. The second collection was made under the direction of the French "Mission Scientifique du Cap Horn," and was studied by M. Bescherelle, of Paris, and Professor Massalongo. A preliminary paper[2] by these writers described the new species and varieties, and their memoir,[3] published a little later, gave a complete enumeration of the plants in the collection with illustrations of many interesting forms. In their list, which includes a number of species found by Dr. Savatier on the western coast of Patagonia, we find 88 species, of which 12 are considered new. The third collection was made by Dr. Naumann during the voyage of the German ship, the *Gazelle*.

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[1] Hepaticæ Antarcticæ; being characters and brief descriptions of the Hepaticæ discovered in the southern circumpolar regions during the voyage of H. M. discovery ships *Erebus* and *Terror*. Lond. Jour. of Bot. **3**: 366–400, 454–481. 1844.

[2] Flora Antarctica, **2**: 423–446. *pl. 156–161.* 1847.

Although collected in the years 1875 and 1876, the account of these hepaticæ was not published until 1890. They were first studied by Dr. Gottsche, of Altona, who made drawings of the various species collected. He also began but did not finish the work of description, and his notes were afterwards revised and completed by Dr. Schiffner, of Prague, who made use of many of Gottsche's figures in the published account[4] of the collection. Sixty-nine species from the straits of Magellan are included in this enumeration, and, of these, 16 are described as new.

The present report is based on a collection made by Mr. John B. Hatcher in the years 1896 and 1897, while engaged in geological field work for Princeton University. Nearly all the plants were found either at Lapataia on the southern coast of Fuegia or at Villarino Bay, about a day's journey to the westward of Lapataia, both stations being situated on the Beagle Channel. A very few species came from the Cordilleras of Patagonia. The collection, which numbers 53 species, includes few novelties, but is of interest in adding to our knowledge of certain rare and incompletely known forms.

In the preparation of this paper I am especially indebted to Dr. B. L. Robinson for allowing me access to the Taylor Herbarium, to Herr

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[1] Epatiche della Terra del Fuoco raccolte nell'anno 1882 dal Dott. C. Spegazzini. Nuovo Giorn. Bot. Ital. **17**: 201–277. *pl. 12–28.* 1885.

[2] Hepaticæ novæ americanæ-australes. Bull. de la Soc. Linn. 626–632, 637–640. 1886.

[3] Hépatiques récoltées par la Mission francaise du Cap Horn au 1882 et 1883. Comptes rendus de la Mission Scientifique du Cap Horn, **5**: 201–252. *pl. 1–5.* 1889.

[4] Lebermoose (Hepaticæ) gesammelt auf der Reise S. M. S. Gazelle vorzüglich in der Magellen-Strasse, auf der Malayischen Inseln und Kerguelen-Land, 1–48. *pl. 1–8.* 1890.

Stephani for helpful notes, drawings and specimens, and to Prof. Nathorst for the loan of two of Ångström's types. Other correspondents who have given me assistance will be mentioned under particular species.

1. ADELOCOLEA UNCIFORMIS (Hook. f. & Tayl.).

Jungermannia unciformis Hook. f. & Tayl. Lond. Jour. Bot. **3**: 457. 1844.
Plagiochila unciformis Hook. f. & Tayl. in G. L. & N. Syn. Hep. 653. 1847.
Adelanthus unciformis Spruce, Jour. Bot. **5**: 200. 1876.
Plagiochila sphalera Hook. f. & Tayl. in G. L. & N. Syn. Hep. 653. 1847.
Jungermannia haliotiphylla De Not. Mem. Acc. Tor. II., **16**: 217. *f. 5.* 1857.
Adelanthus lindenbergianus (Lehm.) Mitt. Jour. Linn. Soc. **7**: 244. 1864.

Lapataia. Punta Arenas (Dusén).

As Mitten[1] has already pointed out, there is a genus *Adelanthus* older than his own. It is the *Adelanthus* of Endlicher, which is now regarded as a synonym of *Pyrenacantha* Wight. Mitten suggests that the name "*Adelocolea*" be substituted for his *Adelanthus* but makes the change in only one species, viz., *Adelocolea decipiens* (Hook.) Mitt.

2. ANDROCRYPHIA PORPHYRORRHIZA Nees in G. L. & N. Syn. Hep. 470. 1846.

Jungermannia porphyrorrhiza Nees in Mart. Fl. Bras. **1**¹: 343. 1833.
Noteroclada porphyrorrhiza Mitt. Bot. of Kerguelen Island: Transit of Venus Exped. 37. 1874.
Jungermannia confluens Hook. f. & Tayl. Lond. Journ. Bot. **3**: 478. 1844.
Androcryphia confluens Nees in G. L. & N. Syn. Hep. 471. 1846.

Villarino Bay. (By Dusén at Punta Arenas and E. Fuegia.)

In Hooker and Taylor's Hepaticæ Antarcticæ, the authors did not divide the old genus *Jungermannia* into distinct genera, but simply into subgenera and the name *Noteroclada* was given to one of these. Two years afterwards, in the Synopsis Hepaticarum, Nees von Esenbeck raised the group to generic rank, but, instead of retaining for it the name *Notero-*

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[1] Challenger Exped., Bot. **1**²: 106. 1884.

clada, substituted the name *Androcryphia.* The latter, therefore, is the oldest for the group as a genus and ought to be retained.

3. ANEURA CALVA Schiffn. & Gottsche, Lebermoose der Forschungsreise S. M. S. "Gazelle," 42. *pl. 8. f. 16.* 1890.

Fuegia.

4. ANEURA CRISPA (Schiffn. & Gottsche) Steph. Hedwigia, **32**: 137. 1893.

Pseudoneura crispa Schiffn. & Gottsche, Lebermoose der Forschungsreise S. M. S. "Gazelle," 41. *pl. 8. f. 14, 15.* 1890.

Fuegia.

The specimens agree with a part of the type-material, kindly sent me by Professor Schiffner. (W. Magellan, Dusén.)

5. ANEURA FUEGIENSIS (Massal.) Evans, Contr. U. S. Nat. Herb. **1**: 142. 1892.

Riccardia fuegiensis Massal. Nuovo Gior. Bot. Ital. **17**: 255. *pl. 26. f. 34.* 1885.

Lapataia.

6. ANEURA PREHENSILIS (Hook. f. & Tayl.). Non Mitt. in Hook. f. Handb. N. Zeal. Fl. 543. 1867.

Jungermannia prehensilis Hook. f. & Tayl. Lond. Jour. Bot. **3**: 480. 1844.
Metzgeria prehensilis Hook. f. & Tayl. in G. L. & N. Syn. Hep. 505. 1846.
Acrostolia prehensilis Trevis. Mem. reale Ist. Lomb. di Sci. e Lett. III. **4**: 431. 1877.
Riccardia prehensilis Massal. Nuovo Gior. Bot. Ital. **17**: 255. 1885.
Aneura savatieri Steph. Hedwigia, **32**: 26. 1893.

Villarino Bay. (W. Magellan, Dusén.)

There has been so much confusion regarding this characteristic plant of southern Patagonia that it seems wise to give a brief review of the literature concerning it and to emphasize again its most important peculiarities. The original description of *Jungermannia prehensilis* (like all in Hooker and Taylor's paper) consists of two parts — a diagnosis in Latin, and a somewhat fuller account in English with comparative remarks. In the Synopsis Hepaticarum we find the diagnosis simply repeated and the English account translated into Latin, so that this description contains nothing new and is essentially like the original. In the Flora Antarctica again, what is practically the same description reappears, but this time is supplemented by a figure of the plant with slightly enlarged details. This original description is, of course, incomplete and the part which applies to the vegetative characters of the plant, particularly so. The following extracts include all the points brought forward about the thallus: "Fronde laxe cæspitosa erecta incurva alata; lobis alternis secundis pinnatis, pinnulis planis linearibus crassinerviis;" "Fronds loosely tufted, with broad hooked tips, the stem flat, brown, pubescent, the pinnules are smoother and of a pale olive green." The plant is compared with *Jungermannia eriocaula* Hook., which is said to be darker green and to have a tripinnate frond with narrower pinnules. Only one station is given, Hermite Island, Cape Horn, and no others are mentioned either in the Synopsis or in the Flora Antarctica.

In the Flora Novæ Zelandiæ, Mitten[1] applies the name *Sarcomitrium prehensile* (changed to *Aneura prehensilis* in the Handbook) to a plant with *smooth* epidermis, and apparently considers it identical with the Fuegian species. With the exception of this character, his description does indeed agree very closely with that of Hooker and Taylor. Massalongo, on the other hand, says of his *Riccardia prehensilis:* "Cellulæ superficiales thalli in appendicem mamillæformem pulcherrime prominent," and Schiffner calls attention to the same peculiarity. Still more recently Stephani, basing his opinion on New Zealand specimens, of *Aneura prehensilis* presumably determined by Mitten, describes a Patagonian plant as *Aneura savatieri* n. sp. and names as his type some of the material referred by Bescherelle and Massalongo to *Riccardia prehensilis.* His description is very clear, the account of the epidermis being as follows: "Cellulæ . . . corticales depresso-imbricatulæ, *i. e.*, apex cellulæ papulosæ supra cellulam proximam parum protractus; margo ubique hyalino subcrenulato." He remarks further: "*Aneura prehensilis* (ex insula N. Zelandia) multo robustior est, epidermide *plano-cellulosa.*"

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[1] Op. cit. 2: 167. 1855.

In view of these conflicting opinions, I have consulted Taylor's original specimens of *Jungermannia prehensilis* from Hermite Island. They are remarkably free from admixture and show the peculiar papillose epidermis described above, indicating that the Patagonian plant is to be looked upon as the true *Aneura prehensilis* (Hook. f. & Tayl.). The New Zealand plant with the smooth epidermis is probably an unnamed species.

The papilliform epidermal cells of *Aneura prehensilis* are somewhat variable in their distribution; on some stems they occur on both surfaces, on others only on the antical surface, while on the pinnules they are scattered and sometimes few in number. A robust rachis is about fifteen cells thick, but its cells are unlike those found in most members of the genus; on the outside there are one or two layers of rather thin-walled cells (including the epidermis) and just inside these are two or three layers of cells with very thick brown walls, the thickening being deposited unequally and leaving irregular cell-cavities; the interior is filled with cells having slightly thickened pale walls. These different kinds of cells do not vary markedly in size.

The nearest ally of *Aneura prehensilis* is the more robust *A. eriocaula* of New Zealand. In this species the rachis, as described by Leitgeb,[1] is essentially like that of the Patagonian plant. The epidermis shows papilliform cells, but the papillæ, instead of being appressed, stand out from the rachis at right angles and give it a hirsute appearance.

7. ANEURA SPEGAZZINIANA (Massal.) Steph. Hedwigia, **32**: 138. 1893.

Riccardia spegazziniana Massal. Nuovo Gior. Bot. Ital. **17**: 254. *pl. 25. f. 32.* 1885.

Fuegia. (W. Magellan, Dusén.)

8. ANTHOCEROS ENDIVIÆFOLIUS Mont. Voy. au Pôle Sud. Bot. Crypt. **1**: 211. 1845.

Lapataia. (Punta Arenas, and W. Magell. Savatier.)

The plants referred to this species agree closely with the detailed description of Massalongo[2] as well as with the more meager original description of Montagne. In the Taylor Herbarium, there is an *Anthoceros* from Cape Horn, labeled *A. punctatus* which belongs here, and, judging from the description, *A. Jamesonii* Tayl.[1] is also to be considered a synonym.

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[1] Unters. über die Leberm. **3**: 49. 1877.

[2] Nuovo Gior. Bot. Ital. **17**: 258. 1885.

9. BLEPHARIDOPHYLLUM DENSIFOLIUM (Hook.) Ångstr. Öfversigt af Kongl. Vetensk.-Akad. Förhand. **29**, Häft 5: 151. 1874.

Jungermannia densifolia Hook. Musc. Exot. *pl. 36.* 1818.
Scapania densifolia Nees in G. L. & N. Syn. Hep. 72. 1844.
Diplophyllum densifolium Mitt. Jour. Linn. Soc. **15**: 69. 1875.
Martinellia densifolia Trev. Mem. reale Ist. Lomb. di Sci. e Lett. III. **4**: 411. 1877.

Villarino Bay. (By Savatier in Magell. St.)

A very variable species, including *Jungermannia vertebralis* Hook. f. & Tayl., *J. chloroleuca* Hook. f. & Tayl. and *J. pycnophylla* De Not.

10. BLEPHAROSTOMA PILOSUM Evans, Torrey Bulletin, 25: 413. 1898.

Pl. IV, Figs. 1–6.

Sterile: densely cæpitose, brownish-green; stems erect, simple or with a few lateral branches, sparingly or not at all radiculose, the rhizoids, when present, coming from the basal cells of the underleaves; leaves and underleaves similar, transversely inserted, concave, broadly orbicular-quadrate in general outline, deeply 4-parted (about $\frac{4}{5}$), the segments lanceolate, 4–7 cells wide at base, tapering into capillary points (each composed of a single row of 5 or more cells), and bearing on their margins 5–8 pairs of opposite widely divaricate capillary teeth, becoming successively longer toward the base; upper teeth composed of a single row of cells, lower teeth strongly deflexed, often 2 cells wide in the lower part and giving off a pair or two of tertiary teeth, the external basal teeth of the outer segments much larger than the others and making the leaves appear 6-parted; undivided basal part of the leaves about 4 cells across: leaves subtending branches similar to the others but only 2-parted (though often apparently 4-parted from the large size of the external basal teeth of the segments): leaf cells oblong, rather thick-walled but without trigones; cuticle often indistinctly and minutely verruculose-striate, especially toward the base of the leaves.

[1] Fl. N. Zeal. **2**: 171. 1855.

Stems 1–2 cm. long, 0.2 mm. wide; leaves 0.85 mm. long and wide, leaf cells averaging 46 μ long, 14 μ wide.

Villarino Bay.

The leaves of the present species are so copiously and finely dissected that the plant remains one at first glance of a *Trichocolea*, but the scanty branching, the dark color and the occasional rhizoids would seem to remove it from that genus. The somewhat problematical *T. polyacantha* (Hook. f. & Tayl.) from New Zealand might, nevertheless, seem from the published descriptions and figures[1] to be identical with our species, but a study of the type material in the Taylor Herbarium shows conclusively that this curious plant is distinct not only from *Blepharostoma pilosum* but also from *B. quadripartitum* (Hook.) Trevis., of which Schiffner[2] has considered it a possible synomym. The New Zealand species is distinguished at once by the numerous paraphylla which clothe the stem and give it a hirsute appearance; they are minute structures, composed of only 2–4 cells and are either simple or forked, their cells, like those of the leaves, being minutely verruculose. Whether the plant is really a *Trichocolea* or not can hardly be settled without a larger supply of material, as the true nature of the involucre cannot be made out without dissection.

In the remarks which supplement Mr. Pearson's description of *Blepharostoma palmatum* Lindb.,[3] a statement is made which would seem to indicate that *B. pilosum* (or some closely allied plant) has sometimes been included under *B. quadripartitum.* The specimens listed below agree closely with authentic specimens of this latter species in the Taylor Herbarium and also with a drawing in the Sullivant collection made from material collected on the Wilkes Expedition. The main differences between the two are the following: *B. quadripartitum* is smaller than *B. pilosum*, and its smaller leaves are less deeply parted (about ⅔), the undivided basal part being about 6 cells across; the leaf-cells are shorter; the leaf-segments are either entire (on slender branches) or sparingly toothed, there being only 1–3 pairs of teeth for each segment, except on the leaf-margins, where there may be 1 or 2 extra ones; the teeth are always short and simple; even on the bracts, where the teeth of the segments are often

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[1] Lond. Jour. Bot. **3**: 290. 1844. Fl. Ant. **1**: 161. *pl. 65. f. 9.* 1844.

[2] Lebermoose der Forschungsreise S. M. S. "Gazelle," 19. 1890.

[3] Jour. Bot. **25**: 193–195. *pl. 275.* 1887.

6–8 in number on each side, they remain short, rarely being more than 3 or 4 cells in length.

11. Blepharostoma quadripartitum (Hook.) Trevis. Mem. reale Ist. Lomb. di Sci. e Lett. III. **4**: 417. 1877.

Pl. IV, Fig. 7–8.

Jungermannia quadripartita Hook. Musc. Exot. *pl. 117.* 1820.
Temnomia quadripartita Mitt. Jour. Linn. Soc. **15**: 68. 1877.
Jungermannia podophylla Ångstr. Öfversigt af Kongl. Vetensk.-Akad. Förhand. **29**, Häft 4: 11. 1872 (*fide* Pearson).
Fuegia.

12. Chiloscyphus massalongoanus Steph. Hedwigia, **32**: 325. 1893.

Chiloscyphus fissistipus Massal. Nuovo Gior. Bot. Ital. **17**: 299. *pl. 18. f. 16.* 1885. (Non Hook. f. & Tayl.)
Chiloscyphus fissistipus var. *magellanicus* Schiffn. & Gottsche, Lebermoose der Forschungsreise S. M. S. "Gazelle," 14. *pl. 2. f. 18.* 1890.
Villarino Bay. (By Savatier in W. Patag. & W. Magell.)

13. Fossombronia naumanii Schiffn. & Gottsche, Lebermoose der Forschungsreise S. M. S. "Gazelle," 39. *pl. 7. f. 23–25.* 1890.

Fuegia.

The present material is all sterile and can only be referred provisionally to the above species, from which it differs in certain points. Professor Schiffner has kindly compared the Patagonian plant with the type of *F. naumanii* from Kerguelen Island and writes me the following note in regard to it: "Differt a *F. naumanii* statura majore, rhizoidis pallidis (nec violaceo-rubris), absentia squamularum dorsalium. Foliorum forma et reticulatione bene congruit. Æque ac *F. naumanii* planta aquatica vel imo palustris esse videtur." In the total absence of reproductive organs it seems wisest not to give our plant a new name.

14. Frullania boveana Massal. Nuovo Gior. Bot. Ital. **17**: 244. *pl. 23. f. 27.* 1885.

Fuegia. (W. Magellan, Dusén; Fuegia, Hariot.)

15. HARIOTIELLA HERMITENSIS Massal. & Besch. Nuovo Gior. Bot. Ital. **5**: 256. 1898 (new series).

Polyotus? hariotianus Besch. & Massal. Bull. Soc. Linn. de Paris, 639. 1886.

Lepidolæna hariotiana Schiffn. in Engler & Prantl, Nat. Pfl. Fam. **1**^{3}: 110. 1895.

Lapataia.

16. HARPALEJEUNEA SUBFENESTRATA (Massal.) Schiffn. & Gottsche, Lebermoose der Forschungreise S. M. S. "Gazelle," 28. *pl. 6. f. 10, 11.* 1890.

Lejeunea subfenestrata Massal. Nuovo Gior. Bot. Ital. **17**: 249. *pl. 25. f. 30.* 1885.

Villarino Bay.

17. JAMESONIELLA COLORATA (Lehm.) Schiffn. in Engler & Prantl, Nat. Pfl. Fam. **1**^{3}: 83. 1893.

Jungermannia colorata Lehm. Linnæa, **4**: 366. 1829.

Villarino Bay. (By Savatier in W. Patag.)

18. JUNGERMANNIA ANTARCTICA Ångstr. Öfversigt af Kongl. Vetensk. Akad. Förhand. **29**, Heft. 4: 10. 1872.

Jungermannia pigafettoana Massal. Nuovo Gior. Bot. Ital. **17**: 217. *pl. 14.* 1885.

Lapataia.

Through the kindness of Professor Nathorst, of Stockholm, I have been enabled to examine a part of Ångström's type of this species, which is preserved in the collections of the Royal Academy of Science; the specimens agree in all respects with those collected by Mr. Hatcher and also with the published description and figures of *Jungermannia pigafettoana.* The original description of Ångström does not give an accurate account of the underleaves. In the diagnosis of the species, we read: "amphigastria ovato- vel lanceolato-subulata"; and, in the fuller description which follows, it is stated: "amphigastria caulis inferioris ovato-subulata, utrinque in parte basali et sub subulam dente uno subulato instructa; in parte superiori caulis lanceolato-subulato subintegra sunt."

As a matter of fact, the underleaves are deeply 2-parted, and the description quoted above applies to the divisions and not to the complete structures. Ångström also omits mention of the cuticle of the leaves, which is strongly verrucose, and is one of the most striking peculiarities of the plant.

19. JUNGERMANNIA HATCHERI Evans, Torrey Bulletin, 25: 417. 1898.

Pl. V, Figs. 1–7.

Jungermannia barbata, B. floerkii Gottsche, Die Lebermoose Süd-Georgiens, 450. *pl. 6.* 1890. Non *Jungermannia floerkii* Web. & Mohr.

Sterile: plants loosely cæspitose or creeping over tufts of *Lophocolea rigens*, yellowish-brown; stems simple or sparingly branched, densely radiculose; leaves closely imbricated, obliquely inserted, more or less crispate, broadly quadrate; abruptly widening from the base, not decurrent, cleft one third or more into 4 obtuse, acute or cuspidate lobes, separated by obtuse or lunulate sinuses, postical margin bearing near the base a cluster of 2–5 fine hair-like cilia, each consisting of 2–8 cells, usually in a single row; underleaves divided almost to the base into 2 slender divisions, bearing cilia in the lower part; leaf-cells rather thin-walled with distinct trigones, cuticle smooth or nearly so; gemmæ reddish-brown, borne in chains and forming clusters on the teeth of the upper leaves, angular, composed of 1 or 2 cells.

Stems .5–1 cm. long, 0.35 mm. in diameter; leaves 1.55 mm. long, 1.20 mm. wide; underleaves 0.55 mm. long, 0.15 mm. wide; leaf-cells on margin 15 μ, in the middle 19 μ, and at the base 23 μ in diameter; gemmæ 15 μ in diameter.

Lapataia.

The present species is an antarctic representative of the *barbatæ*-group of the genus *Jungermannia*, a group of closely allied plants, which forms a most conspicuous feature of the hepatic floras of northern and arctic regions. The presence of basal cilia on the leaves shows an approach to *J. lycopodioides* and *J. floerkii*, and to the latter species the Patagonian plant bears a marked resemblance. The principal points of difference have already been indicated by Gottsche. In *J. floerkii*, the leaves do not broaden out so abruptly from the base as in *J. hatcheri*, their lateral margins are more nearly parallel and their more robust basal cilia are often 2 or 3 cells wide in the lower part; the underleaves are much larger and their segments are often 8–10 cells broad at the base instead of only 3 or 4 cells; in *J. hatcheri*, moreover, the segments end in a single row of 10–20 cells, whereas in *J. floerkii*, there are usually less than 10 cells. The occasional cuspidate leaf-lobes of *J. hatcheri* remind one of the similar structures found in *J. lycopodioides*, but this latter species is much more robust, and has longer and more tortuous basal cilia and larger underleaves with broader and more densely ciliated segments.

20. JUNGERMANNIA PROPAGULIFERA Gottsche, Die Lebermoose Süd Georgiens, 451. *pl. 1. f. 6–12.* 1890.

Plate V, Figs. 8–18.

Paroicous: plants cæspitose, mixed with the preceding species, yellowish-brown or reddish; stems creeping or ascending, branching by innovations, radiculose: leaves imbricated, ovate-quadrate, obliquely spreading, not decurrent, concave, bifid about one third with subacute sinus and lobes, the antical lobe slightly smaller, otherwise entire (or erose-denticulate from the presence of gemmæ); underleaves wanting; leaf-cells polygonal in outline, thin-walled and without trigones; ♀ inflorescence terminal; bracts in 1 or 2 pairs, mostly erect-spreading, similar to the stem-leaves but more crispate, sometimes trifid and with sparingly and irregularly toothed lobes and margins; bracteole connate on one or both sides, with bracts ovate, bilobed or not segmented, toothed or entire; perianth ovate-cylindrical, composed of a single layer of cells, slightly narrowed and plicate in the upper part, minutely denticulate at the mouth, ♂ bracts in 2–4 pairs, situated just below the ♀ bracts, complicate-bilobed, but similar to the stem-leaves when spread out, scarcely inflated at the base and enclosing 1 or 2 antheridia; gemmæ borne on the leaves near the apices of the lobes, yellowish-brown, oblong, composed of 1 or 2 cells: capsule spherical, purple, borne on a long hyaline stalk; spores yellowish-brown, minutely tuberculate; elaters reddish, bispiral.

Stems .5–1 cm. long, 0.22 mm. in diameter; leaves 0.95 mm. long and wide; leaf-cells 28 μ in diameter at base, 22 μ in other parts of the leaf; bracts 1.2–1.35 mm. long, 0.85–1.2 mm. wide, bracteole 1.0–1.1 mm. long, 0.5 mm. wide, perianth 2.9 mm. long, 1.1 mm. in diameter; gemmæ 20 μ in diameter; spores 12–14 μ in diameter.

Lapataia.

In his description of *Jungermannia propagulifera*, Gottsche calls attention to the peculiarities of the perigonial bracts and the gemmiparous stems, but says that the perichætial bracts with the female flowers are still to be desired, thereby implying that the species is dioicous. In other respects the description agrees very closely with the plants collected by Mr. Hatcher, and it seems best to refer the latter's specimens, provisionally at any rate, to Gottsche's species. Curiously enough, both the South Georgian and the Fuegian specimens were found growing with *Jungermannia hatcheri*. *J. propagulifera* is nearly allied to the European *J. socia* Nees, which certain authors[1] consider a variety of *J. excisa* Dicks. It resembles this species in its paroicous inflorescence, in its absence of underleaves, etc. In the European species, however, the leaves are less deeply bifid, so that the sinus is obtuse or lunulate, the leaf-cells have thicker walls and there are slight differences in the bracts.

21. LEJEUNEA SAVATIERIANA Besch. & Massal. Bull. Soc. Linn. de Paris, 638. 1886.

Harpalejeunea savatieriana Schiffn. & Gottsche, Lebermoose der Forschungsreise S. M. S. "Gazelle," 29. *pl. 6. f. 7.* 1890.

Villarino Bay. (By Savatier in W. Patagonia.)

22. LEPICOLEA OCHROLEUCA (Spreng.) Lindb. Acta Soc. Sci. Fenn. **10**: 516. 1875.

Jungermannia ochroleuca Spreng. Syst. Veg. **4**: 325. 1829.
Sendtnera ochroleuca Nees in G. L. & N. Syn. Hep. 240. 1845.
Leperoma ochroleuca Mitt. in Hook. f. Handb. of the N. Zeal. Fl. 754. 1867.
Herberta ochroleuca Trevis. Mem. reale Ist. Lomb. di Sci. e Lett. III. **4**: 397. 1877.

Villarino Bay, etc. (W. Magellan, Dusén.)

23. LEPIDOLÆNA MAGELLANICA (Lam.) Lindb. Jour. Linn. Soc. **13**: 194. 1873.

Jungermannia magellanica Lam. Encycl. Bot. **3**: 284.
Polyotus magellanicus Gottsche in G. L. & N. Syn. Hep. 248. 1845.
Gackströmia magellanica Trevis. Mem. reale Ist. Lomb. di Sci. e Lett. III. **4**: 397. 1877.

Fuegia. (W. Magellan, Savatier.)

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[1] Cf. Massalongo, Atti della Soc. Veneto-Trent. di Sc. Nat. II. **2**: (19). 1895.

24. Lepidolæna menziesii (Hook.) Dumort. Recueil d'obs. sur les Jung. 13. 1835.

Jungermannia menziesii Hook. Musc. Exot. *pl. 118.* 1820.

Polyotus menziesii Gottsche in G. L. & N. Syn. Hep. 247. 1845.

Fuegia. (W. Magellan, Savatier.)

25. Lepidozia filamentosa Lehm. & Lindenb. in G. L. & N. Syn. Hep. 207. 1845.

Jungermannia filamentosa Lehm. & Lindenb. in Lehm. Pugillus, **4**: 29. 1832.

Mastigophora filamentosa Trevis. Mem. reale Ist Lomb. di Sci. e Lett. III. **4**: 416. 1877.

Villarino Bay. (By Savatier in W. Magellan, by Hahn in Isle Hoste.)

26. Lepidozia plumulosa Lehm. & Lindenb. in G. L. & N. Syn. Hep. 211. 1845.

Jungermannia plumulosa Lehm. & Lindenb. in Lehm. Pugillus, **6**: 30. 1834.

Mastigophora plumulosa Trevis. Mem. reale Ist. Lomb. di Sci. e Lett. III. **4**: 416. 1877.

Lepidozia tetradactyıa Tayl. in G. L. & Syn. Hep. 213. 1845.

Jungermannia tetradactyla Hook. f. & Tayl. Lond. Jour. Bot. **3**: 306. 1844.

Fuegia. (W. Magellan, Dusén.)

27. Lepidozia truncatella Nees in G. L. & N. Syn. Hep. 209. 1845.

Mastigophora truncatella Trevis. Mem. reale Ist Lomb. di Sci. e Lett. III. **4**: 416. 1877.

Fuegia.

28. Lophocolea bidentata (L.) Dumort. Recueil d'obs. sur les Jung. 17. 1835.

Lapataia.

29. Lophocolea stenophylla Schiffn. & Gottsche, Lebermoose der Forschungsreise S. M. S. Gazelle, 12. *pl. 3. f. 25–28.* 1890.

Villarino Bay.

30. LOPHOCOLEA HORIZONTALIS (Hook.).

Jungermannia horizontalis Hook. Musc. Exot. *pl. 96.* 1818.
Chiloscyphus horizontalis Nees in G. L. & N. Syn. Hep. 177. 1845.
Jungermannia grandifolia Hook. f. & Tayl. Lond. Jour. Bot. **3**: 474. 1844.
Chiloscyphus grandifolius Tayl. in G. L. & N. Syn. Hep. 185. 1845.

Villarino Bay.

31. LOPHOCOLEA LENTA (Hook. f. & Tayl.) Tayl. in G. L. & N. Syn. Hep. 162. 1845.

Jungermannia lenta Hook. f. & Tayl. Lond. Jour. Bot. **3**: 379. 1844.
Jungermannia diademata Hook. f. & Tayl. *l. c.* **3**: 560. 1844.
Jungermannia secundifolia Hook. f. & Tayl. *l. c.* **3**: 471. 1844.

Lapataia.

32. LOPHOCOLEA OBVOLUTA (Hook. f. & Tayl.).

Jungermannia obvoluta Hook. f. & Tayl. Lond. Jour. Bot. **4**: 80. 1845.

Fuegia.

In the original description of this species no station is given except the Falkland Islands. In the Flora Antarctica, Hermite Island, Cape Horn, is also mentioned. Under the name *Jungermannia obvoluta*, two plants are preserved in the Taylor herbarium; the first of these from the Falkland Islands, must be considered the type of the species; the second from Cape Horn, is apparently distinct, but there is so little of it that it would be unwise to attempt to describe it. In the type-specimen a well-developed leaf is almost longitudinally inserted and is attached by a very broad base, the distance from side to side being about twice as great as that from base to apex. The leaf is more or less distinctly divided into two unequal lobes; the postical, which is slightly the larger, is concave and rounded at the base and extends beyond the stem, at the apex it is bidentate but is otherwise entire; the antical lobe is decurrent and is irregularly lobed and dentate. The leaf-cells average 25 μ in diameter. The specimens collected on the Albatross expedition and referred by the writer to *L. obvolutæformis*[1] agree closely with this type. In Mr. Hatcher's specimens the postical lobe is more coarsely and irregularly dentate than in the type and the leaf-cells are a little smaller, averaging 21 μ in diameter, but the plants are otherwise so similar that they can hardly be separated.

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[1] Contr. U. S. Nat. Herb. **1**: 140. 1892.

It is probable that *Lophocolea obvolutæformis* (De Not.) Massal. also belongs here, although the published descriptions[1] of this species differ from Taylor's specimen in a few minor details. The figure of *L. obvoluta* in the Flora Antarctica does not well represent the species.

33. LOPHOCOLEA PALLIDE-VIRENS (Hook. f. & Tayl.) Mitt. Jour. Linn. Soc. **15**: 72. 1877.

Jungermannia pallide-virens Hook. f. & Tayl. Lond. Jour. Bot. **3**: 473. 1844.

Chiloscyphus pallide-virens Tayl. in G. L. & N. Syn. Hep. 179. 1845.

Villarino Bay.

34. LOPHOCOLEA PUCCIOANA (De Not.) Massal. var. SUSPECTA Massal. Nuovo Gior. Bot. Ital. **17**: 228. *pl. 17. f. 1–9.* 1885.

Villarino Bay. (W. Magellan, Dusén; Fuegia, Hariot.)

Professor Massalongo has kindly confirmed my determination of these specimens. In the Sullivant collection there is a drawing labeled "*Jungermannia humilis*" which was made from specimens collected by the Wilkes Expedition. The drawing represents a plant which is identical with Mr. Hatcher's specimens. As, however, *Jungermannia humilis* Hook. f. & Tayl.[2] seems to have been a composite species and as Mitten[3] has applied the name to a plant without underleaves, it seems wisest not to change the name of De Notaris' plant. *Jungermannia humilis* is apparently not represented in the Taylor herbarium.

35. LOPHOCOLEA RIGENS (Hook. f. & Tayl.).

Jungermannia rigens Hook. f. & Tayl. Lond. Jour. Bot. **3**: 461. 1844.

Dioicous: densely cæspitose, yellowish-green; stems ascending and giving off numerous simple or subdivided, ascending or erect, lateral branches, sparingly radiculose, the radicles in clusters at the bases of the underleaves: leaves imbricated, obliquely inserted, erect-spreading, strongly concave or convolute (especially on the branches), broadly ovate or orbicular, bifid about one-fourth with acute, obtuse or lunulate sinus and acute teeth, otherwise entire, more or less decurrent at antical base: underleaves ovate, bifid one third or more with narrow sharp lobes, usually bearing on each side a small tooth at about the middle, otherwise entire: leaf-cells polygonal, thin-walled, slightly or not at all thickened at the angles: ♀ inflorescence terminal, sometimes innovating, bracts in two or three pairs, less obliquely inserted and slightly larger than the leaves but scarcely different from them in shape; bracteole ovate, bifid about one third and bearing a small tooth on each side above the middle; perianth (young) campanulate, 3-keeled but without wings, 3-lobed at the wide, open mouth and coarsely and irregularly toothed: ♂ infloresence borne in the course of a branch, bracts in several (about 5) pairs, imbricated and convolute, similar in shape to the stem-leaves when spread out, but expanding at the antical base into an inflated pouch usually tipped with a tooth; underleaves not modified.

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[1] Mem. Acc. Tor. II. **16**: *f. 8.* 1855. Nuova Gior. Bot. Ital. **17**: 223. 1885.

[2] Lond. Jour. Bot. **3**: 468. 1844.

[3] Bot. of Kerguelen Island: Transit of Venus Expedition, 34. 1874.

Stems .5–1 cm. long, 0.2 mm. in diameter; leaves (large) 0.75 mm. long and wide; underleaves (large) 0.35 mm. long, 0.3 mm. wide; leaf-cells at edge of leaf 16 μ, in middle 21 μ and at base 25 μ in diameter; perichætialbracts 1 mm. long, 0.85 mm. wide; bracteole 0.95 mm. long, 0.7 mm. wide; perigonial bracts 0.7 mm. long, 0.5 mm. wide.

Lapataia.

This distinct little *Lophocolea* does not seem to have been recorded since its original discovery in the Falkland Islands. Mr. Hatcher's specimens agree very closely with the sterile type material in the Taylor herbarium, and I have given a full account of the species because the original description is far from complete and the figure given in the Flora Antarctica does not adequately represent the plant. Fruiting stems seem to be very rare, the plant apparently spreading by means of small branches, which, when dry, easily become detached.

The authors of *Jungermannia rigens* compared it with the European *J. francisci* Hook., and in the Synopsis it is placed close to that species; the position of the branches, however, which are produced near the postical basal angle of the subtending leaves would at once remove it from the genus *Cephalozia* in which *J. francisci* is now included. *L. rigens* belongs in the puzzling group of *Lophocolea* with bifid leaves. Its small size and yellowish-green color, the curious rolling up of its leaves, which often gives the branches a worm-like appearance and the slight modifications which its bracts undergo will serve to distinguish it.

36. LOPHOCOLEA VASCULOSA (Hook. f. & Tayl.) Nees in G. L. & N. Syn. Hep. 702. 1847.

Jungermannia vasculosa Hook. f. & Tayl. Lond. Jour. Bot. **3**: 461. 1844.
Jungermannia elata Gottsche, Die Lebermoose Süd-Georgiens, 450. *pl. 7. f. 3–6.* 1890.

On trees, Cordilleras of Patagonia. (By Hariot in Fuegia.)

The figures of this species in the Flora Antarctica give a false idea of the underleaves, which are much narrower than is represented. The quoted illustration of *Jungermannia elata*, however, is more accurate in this respect. The Patagonian plants agree closely with the types of *J. vasculosa* in the Taylor Herbarium.

37. MARCHANTIA POLYMORPHA L. Sp. Pl. 1137. 1753.

Cordilleras of Patagonia: Fuegia.

Although the species of *Marchantia* which were collected during the Antarctic voyage were identified by Hooker and Taylor as *M. polymorpha*, they were afterwards referred by Mitten to *M. tabularis* Nees.[1] I had hoped to find the latter species in the present collection, but a study of numerous specimens and a comparison with an authentic, African plant of *M. tabularis*,[2] kindly sent me by Herr Stephani, have shown conclusively that Mr. Hatcher's material of this genus is all referable to *M. polymorpha*.

38. MARSUPIDIUM CRYSTALLINUM (Massal.) Besch. & Massal. Compt. rend. de la Miss. Sc. du Cap Horn, **5**: 229. 1889.

Gymnanthe crystallina Massal. Nuovo Gior. Bot. Ital. **17**: 239. *pl. 22. f. 24.* 1885.
Acrobolbus excisus Schiffn. in Engler & Prantl, Nat. Pfl. Fam. **I**^{3}: 86. 1893.

Fuegia.

The material of this species is all sterile, and is present in small amount. My determination has been kindly verified by Professor Massalongo. It is doubtful if the plant can be retained in *Marsupidium*, as we now understand that genus.

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[1] Hook. f. Handb. N. Zeal. Fl. 545. 1867.

[2] According to Schiffner (Oesterr. botan. Zeitschrift. 1896), *Marchantia tabularis* Nees is a synonym of the older *M. berteroana* Lehm. & Lindenb.

39. MARSUPIDIUM URVILLEANUM (Mont.) Mitt. in Hook. f. Handb. N. Zeal. Fl. 754. 1867.

Plagiochila urvilleana Mont. Ann. des Sc. Nat. II. **19**: 247. 1843.
Scapania urvilleana Mont. in G. L. & N. Syn. Hep. 63. 1844.
Jungermannia urvilleana Hook. f. & Tayl. Lond. Jour. Bot. **3**: 468. 1844.
Gymnanthe urvilleana Tayl. in G. L. & N. Syn. Hep. 193. 1845.
Acrobolbus urvilleanus Trevis. Mem. reale Ist. Lomb. di Sci. e Lett. III. **4**: 423. 1877.
Jungermannia abbreviata Hook. f. & Tayl. Lond. Jour. Bot. **3**: 374. 1844.
Plagiochila abbreviata Tayl. in G. L. & N. Syn. Hep. 646. 1847.

Fuegia.

40. METZGERIA FRONTIPILIS Lindb. Acta Soc. pro Faun. et Flor. Fenn. **1**: 14. *f. 2.* 1877.

Fuegia. (W. Magellan, Savatier.)

41. MYLIA ABDITA (Sulliv.).

Plagiochila abdita Sulliv. in Hook. Jour. Bot. and Kew Gard. Misc. **2**: 317. 1850.
Leioscyphus pallens Mitt. Jour. Linn. Soc. **15**: 68. 1877.

Lapataia.

The type of *Plagiochila abdita* is not to be found at present in the Sullivant Herbarium, but there is a drawing of the species there, which agrees very closely with the Lapataia specimens and also with the published descriptions and figures[1] of *Leioscyphus pallens.* The two genera, *Mylia* and *Leioscyphus* (or *Leptoscyphus*), are both given places by Schiffner[2] in his recent treatment of the genera of Hepaticæ. He recognizes, however, that they are very close to each other and points out only two, purely vegetative, characters to distinguish them: in *Mylia* the leaves are said to be *alternate* and the underleaves *undivided;* whereas in *Leioscyphus*, the leaves are said to be *opposite* and the underleaves *bifid.* The first distinction, however, does not hold, as there are acknowleged species of *Leioscyphus* (*e. g.*, *L. chiloscyphoideus*) with alternate leaves; and the second distinction seems hardly sufficient to separate the genera.

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[1] Mitten, Botany of Kerguelen Island: Transit of Venus Expedition, *pl. 3. f. 6.* 1874. Schiffner and Gottsche, Lebermoose der Forschungsreise S. M. S. "Gazelle," *pl. 3. f. 4, 5.* 1890.

[2] Engler & Prantl, Nat. Pfl. Fam. i. 3. pp. 89, 90. 1893.

42. MYLIA CHILOSCYPHOIDEA (Lindenb.).

Plagiochila chiloscyphoidea Lindenb. in Lehmann, Pugillus, **8**: 4. 1844.
Leioscyphus chiloscyphoideus Mitt. Fl. Tasmaniæ, **2**: 225. 1860.

Fuegia.

43. PIGAFETTOA CRENULATA Massal. Nuovo Gior. Bot. Ital. **17**: 237. *pl. 21. f. 23.* 1885.

Villarino Bay. (By Savatier in W. Patagonia.)

44. PLAGIOCHILA ANSATA Hook. f. & Tayl. in G. L. & N. Syn. Hep. 649. 1847.

Pl. VI, Figs. 1–9.

Jungermannia ansata Hook. f. & Tayl. Lond. Jour. Bot. **3**: 457. 1844.
Plagiochila circinalis var. Besch. & Massal. Bull. Soc. Linn. de Paris, 627. 1886.

Dioicous: plants growing in loose tufts, blackish-brown varying to pale brown or yellowish-green: stems simple or sparingly branched, sometimes innovating from below the perianth, slightly or not at all radiculose: leaves distant or subimbricated, erect-spreading or erect and appressed to the stem, orbicular-obovate, rounded at the broad apex, cuneate at the base, margin entire or repand, the antical decurrent, the postical rounded near the base and less decurrent: underleaves wanting: leaf-cells polygonal (mostly 6-sided), becoming elongated toward base, trigones very conspicuous, separated by narrow thin-walled regions or pits: ♀ inflorescence terminal, the bracts in 2 or 3 pairs, passing by gradual transitions into the stem-leaves, the margins coarsely and irregularly dentate with 1–5 sharp teeth or blunt projections, innermost bracts narrower than the others, ovate or obovate in shape; perianth long-exserted, flattened, exalate, clavate, very gradually narrowed toward the base and truncate at the apex, mouth bilabiate, ciliate-dentate, perianth 2 cells thick except close to the base where it is 3 cells and near the mouth where it is only one cell.

Stem 5 cm. or more long, 0.25 mm. in diameter; leaves 1.5 mm. long, 1.4 mm. wide; leaf-cells on edge of leaf 25 μ, in the middle 29 μ and at the base 53 μ × 29 μ; bracts of innermost row 1.5 mm. × 0.95 mm. and 1.7 mm. × 1.35 mm., perianth 4 mm. long, 1.2 mm. wide.

Villarino Bay.

Plagiochila ansata is a species of wide distribution in southern regions, having been reported also from the Falkland Islands and from New Zealand. The type specimens from the first of these localities agree closely with the Fuegian plants; but, as the published descriptions and figures of the species are somewhat inadequate, it has seemed advisable to describe and figure it anew. The description given above is drawn from robust stems, particularly those bearing perianths; sterile stems and the branches and innovations of fertile plants are sometimes much more slender and bear scattered and smaller leaves. Even in the most slender forms, however, the characteristic leaf-cells with their well-developed trigones are retained. Judging from the description, the specimens doubtfully referred by Bescherelle and Massalongo to *Plagiochila circinalis* belong here. Herr Stephani has kindly sent me a specimen of the last-named species from Australia; and, although it is certainly a near ally of *P. ansata*, it differs from it in the following points: the plants are more robust, the leaves are densely imbricated and their antical margins spread out from the stem and are strongly revolute throughout nearly their whole length, the leaf-cells are scarcely, if at all, elongated at the base, their trigones are even more conspicuous, they are oval or circular in outline and are very frequently confluent.

45. PLAGIOCHILA BISPINOSA Lindenb. Ann. Sci. Nat. IV. **8**: 326. *pl. 11. f. 7–13.* 1858.

Villarino Bay. (W. Magellan, Savatier.)

46. PLAGIOCHILA DURICAULIS Hook. f. & Tayl. in G. L. & N. Syn. Hep. 641. 1847.

Jungermannia duricaulis Hook. f. & Tayl. Lond. Jour. Bot. **3**: 458. 1844.

Fuegia. (W. Magellan, Savatier.)

47. PORELLA FŒTENS (De Not.) Trevis. Mem. reale Ist. Lomb. di Sci. e Lett. III. **4**: 407. 1877.

Madotheca fœtens De Not. Mem. Acc. Tor. II. **16**: 231. *f. 17.* 1855.

Villarino Bay.

48. Radula flavifolia Tayl. in G. L. & N. Syn. Hep. 259. 1845.

Jungermannia flavifolia Hook. f. &. Tayl. Lond. Jour. Bot. **3**: 476. 1844.
Fuegia.

49. Schistochila gayana (Gottsche) var. massalongoana (Schiffn. & Gottsche).

Gottschea gayana var. Massal. Nuovo Gior. Bot. Ital. **17**: 205. *pl. 12. f. 2.* 1885.
Gottschea gayana var. *massalongoana* Schiffn. & Gottsche, Lebermoose der Forschungsreise S. M. S. "Gazelle," 2. 1890.
Villarino Bay. (W. Magellan, Dusén.)

50. Schistochila lamellata (Hook.) Dum. Recueil d'obs. sur les Jung. 15. 1835.

Jungermannia lamellata Hook. Musc. Exot. *pl. 49.* 1818.
Gottschea lamellata Nees in G. L. & N. Syn. Hep. 20. 1844.
Villarino Bay. (W. Magellan, Dusén.)

51. Schistochila laminigera (Hook. f. & Tayl.) Evans, Contr. U. S. Nat. Herb. **1**: 141. 1892.

Jungermannia laminigera Hook. f. & Tayl. Lond. Journ. Bot. **3**: 456. 1844.
Gottschea laminigera Tayl. in G. L. & N. Syn. Hep. 623. 1846.
Fuegia.

52. Trichocolea tomentosa (Swartz) Gottsche in G. & R. Hep. Eur. Exs. no. 272.

Jungermannia tomentosa Swartz, Prod. Fl. Ind. occ. 145. 1788.
Jungermannia tomentella var. *tomentosa* Lindenb. Hep. Eur. 19. 1829.
Trichocolea tomentella var. *tomentosa* G. L. & N. Syn. Hep. 237. 1844.
Leiomitra tomentosa Lindb. Acta Soc. Sci. Fenn. **10**: 515. 1875.
Basichiton tomentosum Trevis. Mem. reale Ist. Lomb. di Sci. e Lett. III. **4**: 394. 1877.
Fuegia. (By Savatier in W. Magellan.)

53. Tylimanthus anderssonii (Ångstr.).

Pl. VI, Figs. 10–19.

Jungermannia tenella Ångstr. Öfversigt af Kongl. Vetensk.-Akad. Förhand. **29**, Häft 4: 11. 1872. (Not Hook f. & Tayl.).

Gymnanthe anderssonii Ångstr. l. c. **33**, Häft **4**: 50. 1876.

Dioicous: growing in loose tufts or mixed with other hepaticæ, pale or whitish-green: plants consisting of a prostrate caudex giving rise to ascending or erect stems: caudex radiculose, usually bearing scattered rudimentary leaves: stems without rhizoids or with a few scattered ones close to the caudex, simple or sparingly branched, sometimes giving off radiculose stolons from the lower part; stem-leaves distant and rudimentary below, more or less imbricated and larger above, obliquely inserted, somewhat concave, obovate-orbicular from a narrowed base, antical margin decurrent, straight or slightly curved, entire, postical margin reaching nearly to middle of stem, slightly or not at all decurrent, entire, sinuate, or with a few scattered teeth, apex broad and variable, sometimes distinctly emarginate-bilobed, with acute, obtuse or rounded lobes, sometimes truncate, entire or sparingly and irregularly dentate with blunt teeth; underleaves wanting; leaf-cells thin-walled with small but distinct trigones, somewhat elongated toward base, cuticle smooth: ♀ inflorescence terminal on short ascending stems or elongated branches; bracts crowded, similar to the leaves, but even more irregular in shape, sometimes unequally 2-lobed, the innermost narrower and more delicate than the others and sometimes more conspicuously toothed, sac tapering to a blunt point, radiculose: ♂ inflorescence borne in the course of ascending stems, bracts in about five pairs, imbricated, strongly saccate below, but with spreading apices above, broadly orbicular when explanate, truncate or emarginate-bifid, the postical lobe being the larger.

Stems 1.5–3 cm. long, 0.35 mm. in diameter; leaves 1.7 mm. long, 1.85 mm. broad; leaf-cells at base 58 μ long, 29 μ broad, in other parts of the leaf 29 μ in diameter; outer perichætial bracts 1.9 mm. long and broad, sac 2.7 mm. long, 1 mm. in diameter; perigonial bracts 1 mm. long, 1.45 mm. wide. The foregoing measurements may be considered representative of this very variable species.

Lapataia.

In its pale color and in the shape and areolation of its leaves, the present plant strongly resembles *Marsupidium urvilleanum*, which is a more robust species with its leaves more strongly dentate and inflexed on their antical margins. As far as can be judged from descriptions, the two species differ from each other in the position of the ♀ inflorescence and pendant sac, necessitating their separation into distinct genera. In *Marsupi-*

dium urvilleanum, this sac is described by Mitten[1] as "attached to the lower part of the stem by its side"; in the closely related (if not identical) *M. brecknockiense* (Massal.) Besch. and Massal., its author[2] says: "perichætia ad ramorum basim et in ramulo brevissimo sublaterali radicante posita"; in the species described above, on the contrary, the sac is clearly terminal on ascending stems or elongated branches, showing that the plant is a *Tylimanthus*. The sac moreover has the same structure as that ascribed to this genus—its wall is closely adherent to the calyptra and it bears a cluster of unfertilized archegonia at its mouth. At my request Professor Nathorst has kindly sent me some of the original specimens of *Gymnanthe anderssonii* as determined by Ångström. So far as can be decided from sterile plants, these belong to the same species as Mr. Hatcher's specimens, although in some of them the leaves are a little more toothed.

SUPPLEMENTARY LIST OF PATAGONIAN HEPATICÆ.

The hepaticæ collected in the Magellan-region and in Fuegia by the French *Mission Scientifique du Cap Horn*, 1882–1883, described by Bescherelle and Massalongo, and those collected by Dusén in 1896, and described by F. Stephani, contain the following species in addition to some of the species in the Hatcher Collection.[3]

Adelanthus magellanicus (Ldbg.) Spruce.	W. Magell.; S. Fuegia.
A. unciformis (H. f. & Tayl.) Spr.	W. Patagon.
Acolea concinnata Dum.	S. Fuegia.
Alicularia spathulifolia Steph.	W. Magellan, 200 m. above sea-level.
Anastrophyllum decurrens Steph.	W. Magell.
A. involutifolium (Mont.).	W. Magell.
A. longissimum Steph.	W. Magell.
Aneura floribunda Steph.	S. Patag.; W. Magell.; N. Fuegia.
A. fragilis Steph.	W. Magell.; S. Fuegia.
A. pallide-virens Steph.	W. Magell.
A. pinnatifida Nees.	S. Patagon.; S. Fuegia.
A. pulvinata Steph.	W. Magell.
A. spectabilis Steph.	W. Magell.; E. & S. Fuegia.
A. tenax Steph.	W. Magell.

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[1] Handb. N. Zeal. Fl. 754. 1867.

[2] Nuovo Gior. Bot. Ital. **17**: 214. 1885.

[3] *Miss. Scient. du Cap Horn.* Tom V. Botanique, Paris, 1889, Hépatiques, pp. 201–252; *Lebermoose der Magellansländer* von F. Stephani, mit einer Einleitung von P. Dusén, Bihang till K. Svenska Vet.-Akad. Handlingar. 26. III. 17. Stockholm, 1901.

Anthoceros jamesonii Tayl.	S. Fuegia, by Ushuaia.
Balantiopsis chilensis Steph.	W. Magell.
Bazzania novæ-zelandiæ (Mitten).	Magell., Desolation I.
Brachio-lejeunea spruceana Mass.	W. Magell.
Cephalozia scabrella Mass.	W. Magell.
C. simulans Mass.	Fuegia.
C. tabulata Hook. f. & Tayl.	W. Magell.; S. Fuegia.
Chiloscyphus coalitus (Hook.) Nees.	W. Patagon.
C. (?) *grandiflorus* Tayl. & H. f.	Magell.
C. horizontalis (Hook.) Nees.	W. Magell.; S. Fuegia.
C. integrifolius N. & N. L. & L.	W. Magell.
C. (?) *pallide-virens* Tayl.	Fuegia.
C. striatellus Mass.	W. Magell.
C. valdiviensis Mont.	W. Magell.
Diplophyllum densifolium Hook.	W. Magell.; S. Fuegia.
Frullania diplota Tayl.	S. Patagon.; N. & S. Fuegia.
F. fertilis DeNot.	S. Patagon.; S. Fuegia.
F. ptychantha Mont.	W. Magell.
Gottschea gayana Gott.	W. Patagon.
G. lamellata (Hook.) Nees.	Magell.; W. Patagon.
G. laminigera.	W. Magell.
G. pachyla.	W. Magell.; Fuegia.
G. splachnophylla Tayl.	Magell.
Isotachis anceps Mont.	W. Magell.; S. Fuegia.
I. bisbifida Steph.	W. Magell.
I. madida Tayl.	W. Magell.; at 250 m. above sea-level.
I. quadriloba Steph.	W. Magell.
I. spegazziniana Mass.	W. Magell. & S. Fuegia at 200 m. above sea.
I. splendens Steph.	W. Magell., at 200 m. above sea-level.
Jamesoniella colorata (Lehm.).	S. Fuegia.
J. grandiflora L. & G.	W. Magell.; S. Fuegia. Alpine.
J. œnops (L. & G.) Steph.	W. Magell.
J. paludosa Steph.	W. Magell.
Jungermannia cribrifolia Tayl. & H. f.	Fuegia.
J. parcæformis Mass.	S. Patagon.
J. pigafettoana Mass.	S. Patagon.; S. & W. Fuegia.
J. quadripartita Hook.	Fuegia.
J. schismoides Mont.	S. Fuegia.
Leioscyphus abnormis Mass.	W. Magell.; S. Fuegia.
L. æquatus Tayl.	W. Magell.; S. Fuegia. At elevations.
L. chiloscyphoides L. & L.	W. Magell.; S. Fuegia.
L. repens Mitt.	S. Fuegia.
L. setistipus Steph.	E. & S. Fuegia.
L. surrepens (Tayl.).	W. Magell.; S. Fuegia.
L. turgescens (Tayl.).	W. Magell.; S. Fuegia.

Lejeunia decurvicuspis Besch. & Mass.	W. Patagon.
L. fuegiana Besch. & Mass.	S. Fuegia.
L. parasitica Tayl.	W. Patagon.
L. rufescens Ldbg.	Magell.
L. subfenestrata Mass.	Fuegia.
Leperomia ochroleuca (Spr.) Mitt.	W. Patagon.
Lepicolea quadrilaciniata Sull.	E. & S. Fuegia.
L. teres Steph.	S. Fuegia, by Ushuaia.
Lepidolæna hariotiana (Mass.) Steph.	W. Magell.; S. Fuegia.
L. magellanica (Lam.).	W. Magell.; S. Fuegia.
L. menziesii (Hook.).	W. Magell.; S. Fuegia.
Lepidozia blepharostoma Steph.	W. Magell.
L. capillaris (Swartz) Ldbg.	W. Patagon.
L. capilligera (Schwaegr.) Ldbg.	S. Fuegia.
L. cordulifera DeNot.	S. Patagon.; S. Fuegia.
L. cupressina (Swartz.) Ldbg.	S. Fuegia.
L. oliogophylla L. & L.	W. Magell.; S. Fuegia.
L. plumulosa L. & L.	W. Magell.; S. Fuegia.
L. saddlensis Mass.	W. Magell.; S. Fuegia.
L. seriatitexta Steph.	W. Magell.
L. setiformis DeNot.	S. Fuegia.
Lophocolea austrigena Tayl.	W. Magell.; Fuegia.
L. boveana Mass.	W. Magell. & S. Fueg., at 600 m. elevation.
L. concava Steph.	S. Fuegia.
L. cookiana Mass.	W. Magell.; S. Fuegia.
L. divergenticiliata Steph.	S. Fuegia.
L. fulvella (Steph.).	W. Magell.; S. Fuegia.
L. fuscovirens (Tayl.).	Magellan; S. Fuegia.
L. gayana (Mont.).	W. Magell.
L. gottscheæoides Mass.	W. Magell.; S. Fuegia.
L. humifusa Tayl.	W. & S. Fuegia.
L. humilis Hook. & Tayl.	W. Magell.; S. Fuegia.
L. irregularis Steph.	S. Patagon.; E. & S. Fuegia.
L. lacerata Steph.	W. Magell.
L. muricata (?) Nees.	W. Patagon.
L. novæ-zelandiæ (Lind. & Leh.) Nees.	Fuegia.
L. obvolutæformis Mass.	Magell.
L. otiphylla (Tayl.).	W. Magell.; S. Fuegia.
L. palustris (Tayl.).	W. Magell.; S. Fuegia.
L. purpucilla Tayl.	Fuegia.
L. spegazziniana Mass.	W. Magell.
L. textilis Tayl.	W. Magell.; E. & S. Fuegia.
L. trachyopa Tayl.	Fuegia.
L. triseriata Steph.	W. Magell.; E. Fuegia.
L. vascularis Nees.	S. Fuegia.

L. virens Tayl.	S. Patagon.; W. Magell.; S. Fuegia.
Madotheca subsquarrosa N. & M.	W. Magell.
Marchantia cephaloscypha Steph.	Magell.
M. tabularis Nees.	S. Patagon., S. Fuegia.
Marsupella kerguelensis Schffn.	S. Fuegia, 600 m. above sea-level.
Marsupidium crystallium Mass.	W. Patagon.
Mastigobryum peruvianum Nees.	W. Magell.
Mastigophora antarctica Steph.	W. Magell.
Metzgeria angusta Steph.	S. Patagon.; N. Fuegia.
M. dusenii Steph.	W. Magell.
M. furcata (L.) Ldbg.	W. Magell.
M. glaberrima Steph.	W. Magell.; S. Fuegia. On stems of trees.
M. hamata Ldbg.	S. Fuegia.
M. pubescens Raddi.	S. Fuegia.
Noteroclada confluens Tayl.	Magell.
Plagiochila ambusta Mass.	W. Magell.; S. Fuegia.
P. angulata Steph.	W. Magell.
P. circinalis (Lehm.) Ldbg.	Fuegia.
P. dura DeNot.	W. Magell.
P. fagicola Schffn.	W. Magell.
P. fuegiensis (Mass.).	W. Patagon.
P. heteromalla L. & L.	W. Magell.
P. hirta Tayl.	W. Magell.
P. hyadesiana Mass.	W. Magell.
P. jacquinotii Mont.	Fueg.
P. patagonica Besch. & Mass.	W. Patagon.; W. Magell.
P. lechleri Gottsche.	W. Magell.
P. neesiana Ldbg.	W. Magell.
P. obcuneata Steph.	Magellan.
P. savatierana Besch. & Mass.	W. Magell.; W. Patagon.
P. subpectinata Besch. & Mass.	Fuegia.
P. uncialis H. f. & Tayl.	W. Magell.
P. rectangulata Step.	S. & W. Fuegia.
P. remotidens Steph.	W. Magell.
P. robusta Steph.	S. Fuegia.
Radula helix Tayl.	W. Magell.
R. intempestiva Gottsche.	W. Magell.
R. plicata Mitt.	W. Magell.; S. Fuegia.
R. plumosa Mitt.	In S. Fuegia.
R. punctata Steph.	W. Magell.
R. striata Mitt.	W. Magell.
Reboulia hemisphærica ? (L.) Reddi.	W. Patagon.
Riccardia eriocaula (Hook.).	W. Magell.
R. fuegiensis Mass.	W. Magell.
R. prehensilis (Tayl. & Hk. f.).	W. Patagon.

R. pinguis (L.) Gray.	Fuegia.
R. spegazziniana Mass.	W. Magell.
R. spinulifera Mass.	W. Magell.
Scapania antarctica Steph.	S. Fuegia.
Schisma chilensis De Not.	W. Magell.
Schistocheila cunninghamii Steph.	Magell.; S. Fuegia.
S. pachyla Tayl.	W. Magell.
S. planifolia Steph.	W. Magell.
S. spegazziniana (Mass.).	W. Magell.
S. splachnophyllum (Tayl.).	W. Magell.; S. Fuegia.
Strepsilejeunia warnstorffii Steph.	W. Magell.
Symphyogyna crassifrons Sull.	W. Magell.; S. Fuegia.
Trichocolea verticillata Steph.	W. Magell.; S. Fuegia.
Tylimanthus brecknockiensis Steph.	W. Magell.
T. crystallinus (Mass.) Steph.	W. Magell.
T. integrifolius Steph.	W. Magell., alpine.

PART III.

PATAGONIAN AND FUEGIAN MOSSES.

BY

P. DUSÉN.

THE mosses collected by Mr. J. B. Hatcher in South America in the years 1896 and 1897 are mostly from the district around the sources of the Rio Chico (in about 48° S. L.) on the eastern slope of the Patagonian Cordillera. Some were collected in the vicinity of Punta Arenas on the north side of the Straits of Magellan, others in the southern part of Tierra del Fuego, at Ushuaia, Lapataia and Villarino; but from the Patagonian east coast there is only one species, though a new one, *Hypnum perplicatum.* In not a few cases no particulars are given of habitations and conditions, under which the different species are living.

This collection, though not a very comprehensive one, is of great interest, partly because it was brought together from a district, the Rio Chico territory, which has been very seldom visited by naturalists and from which, as far as I am aware, no bryological collections were previously derived. Altogether the Hatcherian mosses number 71 species, of which no less than 24 are entirely new to science.

Long ago C. Müller Hal. pointed out the striking similarity existing between the moss-vegetation of Patagonia and Tierra del Fuego on the one side, and that of Kerguelen Island, Tasmania, Auckland Island, Campbell Island, New Zealand and Australia on the other. The districts enumerated not only exhibit species of a very close affinity, but even many identical species, a fact which is well confirmed by Hatcher's collection, although it scarcely contains one third of the number of mosses from the Fuegian territory, that are known to me. The following Hatcherian species, not counting such as should be considered cosmopolitan, are common to all or some of the above districts, namely: *Dicranum billardieri* Schwaegr., *Dicranum robustum* Hook. fil. et Wils., *Campylopus introflexus* (Hedw.) Mitt., *Polytrichadelphus magellanicus* (L.) Mitt.,

Catagonium politum (Hook. et Wils.) C. Müll., *Rhacomitrium lanuginosum* (Hedw.) Brid., *Rhizogonium mnioides* (Hook.) Sch., and *R. subbasilare* (Hook.) Sch., *Bryum bimum* Schreb., *Leptobryum pyriforme* (Hedw.) Sch., *Webera cruda* (L.) Schwaegr., *Distichium capillaceum* (L.) Br. Eur., *Aulacomnium palustre* (L.) Schwaegr., *Orthotrichum rupestre* Schleich., *Lepyrodon lagurus* (Hook.) Mitt. and *L. implexus* (Kze.) Par., and *Brachythecium paradoxum* (Hook. fil. et Wils.) Besch.

Apart from new species, nearly one third of Hatcher's mosses are also found outside of the district now in question, in other temperate parts of the southern hemisphere.

The affinity above alluded to likewise exists between the moss vegetation of Patagonia and Tierra del Fuego and that of the temperate districts of the northern hemisphere, although the number of common species in this case is not so large as in the other. The following Hatcherian mosses belong also to the temperate zone north of the equator, namely: *Campylopus introflexus* (Hedw.) Mitt., *Rhacomitrium lanuginosum* (Hedw.) Brid., *Bryum bimum* Schreb., *Leptobryum pyriforme* (Hedw.) Sch., *Webera cruda* (L.) Schwaegr., *Distichium capillaceum* (L.) Br. Eur., *Aulacomnium palustre* (L.) Schwaegr., and *Orthotrichum rupestre* Schleich., the two last named being now for the first time reported as natives of Patagonia.

On the other hand, there are not a few species missing, which one would *a priori* except to find in this collection. Many genera and even families, having numerous representatives in the coast districts of Patagonia and the more humid parts of Tierra del Fuego, are either wanting altogether or at the most very scantily represented. The genus *Andreæa*, for instance, which shows a large number of species within the former sections has none at all here, this likewise applying to *Hypopterygium*, *Breutelia* and *Ptychomnium;* the family of *Hookeriaceæ* has not a single representative. Sparingly represented are the genera *Ulota*, *Dicranum* and *Campylopus*, which are elsewhere very rich in species. That so many species characteristic of the region in question and commonly spread at least within its more humid parts, should be wanting in the Hatcher collection, might be explained by the fact of its having been brought together partly at least from a comparatively dry section of the eastern slope of the Cordillera. Thus it is that Hatcher's mosses scarcely even hint at a very interesting feature of the West-Patagonian and Fuegian moss-vegetation, which has been already accentuated by C. Müller (Hal.), viz: that several genera which, as a rule, are confined to tropical and subtropical regions, are represented here by not a few species. *Hypopterygium*, for instance, displays three species, *Pilotrichella* two, *Cryphæa*, *Dendrocryphæa*, *Daltonia* and *Hookeria* one each, and *Pterygophyllum*, *Mniadelphus* and *Macromitrium* several species. Of Hatcher's mosses only two represent tropical types, *Macromitrium bifasciculare* n. sp. and *Macromitrium tenax* C. Müll. These tropical representatives are almost exclusively to be found in the most westerly part of our district. They follow the coast and reach comparatively high latitudes; a few even extend to Cape Horn. The explanation of this, I think, is to seek in the mild climate of the western coast region.

The occurrence of tropical types within our district, as is well known, is not limited to the mosses exclusively, but also includes the phanerogamic plants. The affinity spoken of above between the moss-vegetation of our territory and that of Kerguelen Island, New Zealand and Australia is not an exceptional feature, but also prevails among the phanerogamic flora of the several districts, even though it is less marked there than in the mosses.

SPHAGNALES.

Fam. SPHAGNACEÆ.

Gen. SPHAGNUM Dill.

SPHAGNUM FIMBRIATUM Wils. var. ROBUSTUM Braithw.

Hab. Patagonia australis.

SPHAGNUM MEDIUM Limpr. var. FUSCO-RUBELLUM Warnst.
f. BRACHYDASYCLADA Warnst.

Hab. Patagonia australis.

BRYALES.

ACROCARPINEÆ.

Fam. DICRANACEÆ.

Subfam. *DICRANELLEÆ.*

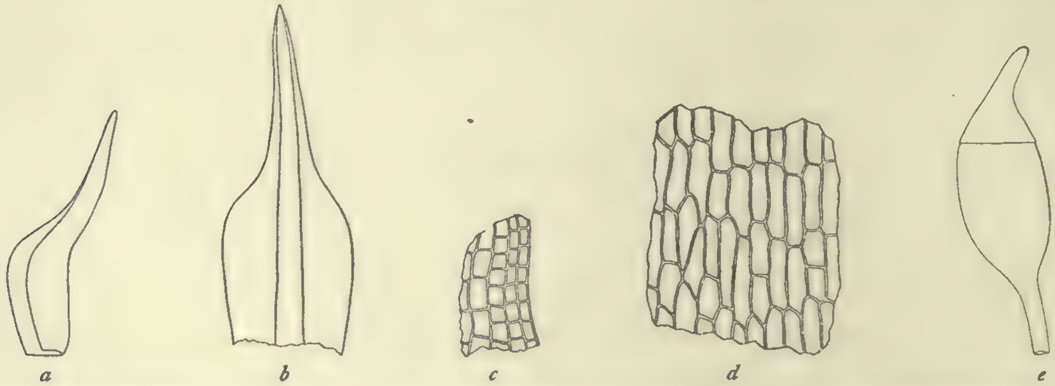
Gen. ANISOTHECIUM Mitt.

ANISOTHECIUM PERPUSILLUM Dusén n. sp.

Pl. VII, Figs. 1, 2.

Dioicum; dense cæspitosum, cæspitibus paulum cohærentibus, lutescente viridibus, haud nitidis; *caulis* gracilis, erectus, plerumque strictus, simplex vel superne innovando ramulosus, usque ad 2.5 cm. altus, e basi ad medium plus minusque dense rufo-tomentosus, *folia* densiuscule conferta, rigida, usque ad 1.8 mm. longa et basi (haud planefacta) c. 0.4 mm. lata, e basi erecta patentia, siccitate superne incurvata, humiditate stricta, e basi amplexicauli lata brevique et sursum sublatiori raptim contracta et subulate attenuata, canaliculata, marginibus erectis, integerrimis; *nervo* valido, basi c. 0.09 mm. crasso, concolori, cum apice desinente; *cellulæ* flavo-virides, pellucidæ, firmæ, basales rectangulæ, ceteræ subquadratæ; *bracteæ perichætii* foliis caulinis similes, sed majores, cellulis aureo-brunneis; *seta* erecta, stricta, siccitate dextrorsum torta, sat robusta, usque ad 1 cm. alta, straminea, ætate brunnea; *theca* erecta, stricta, paullum asymmetrica, humiditate breviter ovalis, siccitate breviter subcylindrica, pachyderma, lævissima, brunnea, macrostoma, ore subobliquo; *dentes peristomii* lanceolati, circiter a medio in cruribus binis fissi, rarissime integri et perforati, superne hyalini et lævissimi (?) ceterum flavi et papillosi, papillis longitudinaliter seriatis; *operculum* conicum, oblique rostratum, rostro crasso, theca breviori.

FIG. 1.



Anisothecium perpusillum Dusén. *a*, folium a latere visum, $\frac{32}{1}$; *b*, folium planefactum, $\frac{32}{1}$; *c*, cellulæ apicales, $\frac{200}{1}$; *d*, cellulæ basales, $\frac{200}{1}$; *e*, capsula operculata humiditate, $\frac{18}{1}$.

Planta mascula pusilla, c. 5 mm. alta, simplex vel apice plerumque innovationem unicam emittens, foliis ut in planta fem.; flos terminalis vel ob innovationem pseudolateralis, gemmaceus; bracteæ e basi lata ovalique sat subito contractæ, longe capillari-attenuatæ; paraphyses numerosi, filiformes, flavi.

Hab. Patagonia australis, ubi species verisimiliter in territorio fontinali fluminis Rio Chico lecta est.

Allied to *Anisothecium rufipes* (C. Müll.); differing from that species by the much broader basal part of its leaves, being shorter subulate and quite entire (not crenulate); by the absence of apophysis, and by its much shorter rostrate lid.

Subfam. *DICRANEÆ.*

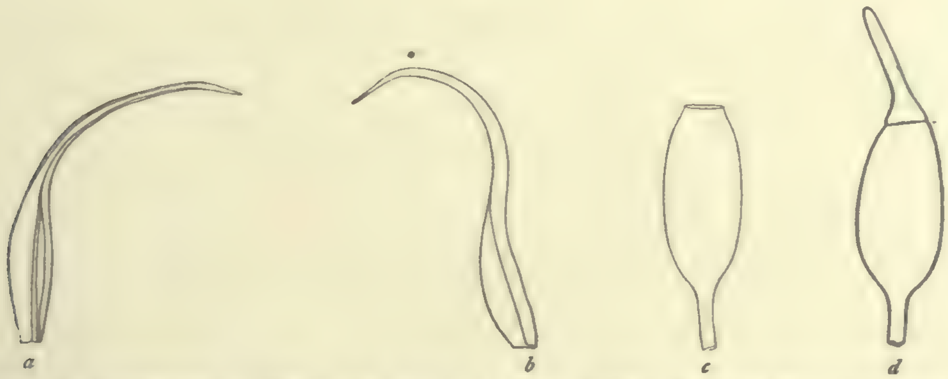
Gen. DICRANOWEISIA Lindl.

DICRANOWEISIA PERPULVINATA Dusén n. sp.

Pl. VII, Figs. 3, 4.

Autoica; densissime pulvinatim cæspitosa, cæspitibus usque ad 6 cm. latis, lutescente viridibus, inferne fuscis; *caulis* sat dense ramosus, apice innovando ramulosus, usque ad 1.5 cm. altus, infima basi solummodo radiculosis; *folia* sicca crispata, humida stricta vel leviter curvata, suberecta, e basi amplexicauli, subdecurrente et fere lineari subulate elongata, usque ad 3.6 mm. longa, canaliculata, integerrima, *nervo* basi 0.05 mm. crasso, infra summum apicem desinente; *cellulæ* basales elongate rectangulæ, alares paucæ, amplæ, quadratæ vel subquadratæ, omnino hyalinæ, ceteræ rotundate quadratæ, 0.008–0.010 mm. magnæ, vel papillosæ, parietibus incrassatis; *bracteæ perichætii* exteriores foliis caulinis similes, inte-

FIG. 2.



Dicranoweisia perpulvinata Dusén. *a*, *b*, folia, $\frac{18}{1}$; *c*, capsula vetusta humiditate, $\frac{18}{1}$; *d*, capsula calyptrata humiditate, $\frac{18}{1}$.

riores erectæ, convolutæ, apice cito contractæ, breviter acutatæ, nervo infra apicem evanido, cellulis anguste elongatis, parietibus valde incrassatis, apicalibus ceteris multo brevioribus; *seta* erecta stricta c. 1 cm. alta, siccitate sinistrorsum torta, flavo-brunnea; *theca* oblongo-ovalis, c. 1.8 mm. longa et 0.6 mm. crassa, pallide brunnea, leptoderma macrostoma, siccitate longitudinaliter subrugosa; *annulus* nullus; *dentes peristomii* 16, subulati, c. 0.163 mm. alti et basi 0.03 mm. lati, remote trabeculati, trabeculis c. 7 sat crassis, inferne aurantiaci et lævissimi, superne pallidiores, fere hyalini et minutissime papillosi, apice haud fissi; *operculum* conicum, oblique rostratum, rostro theca subæquilongo; *sporæ* 0.016–0.020 mm. magnæ, lævissimæ.

Hab. Patagonia australis.

Closely resembling *Dicranoweisia crispula* (Hedw.) Lindb. and nearly allied to that species, scarcely differing save in its peristome, the teeth of which are shorter and more slender than in the aforenamed species. It is also remotely trabeculated and papillose only in its upper part, sometimes nearly quite glabrous.

From *Dicranoweisia austro-crispula* (C. Müll.) Par. it differs, to judge from the diagnosis, by its shorter and oval capsule and its shorter and more rigid leaves.

Nearly related also to *Dicranoweisia antarctica* (C. Müll.) Par., differing from that species by the middle and upper round-quadrate cells of its leaves.

Gen. DICRANUM Hedw.

Dicranum billardieri Schwaegr.

Hab. Fuegia australis.

Dicranum nigricaule Aongstr.

Hab. Patagonia australis.
Fuegia australis ad Villarino.

Dicranum robustum Hook. fil. et Wils.

Hab. Fuegia australis.

Dicranum australe Besch.

Hab. Fuegia australis ad Villarino.

Dicranum leucapterum C. Müll.

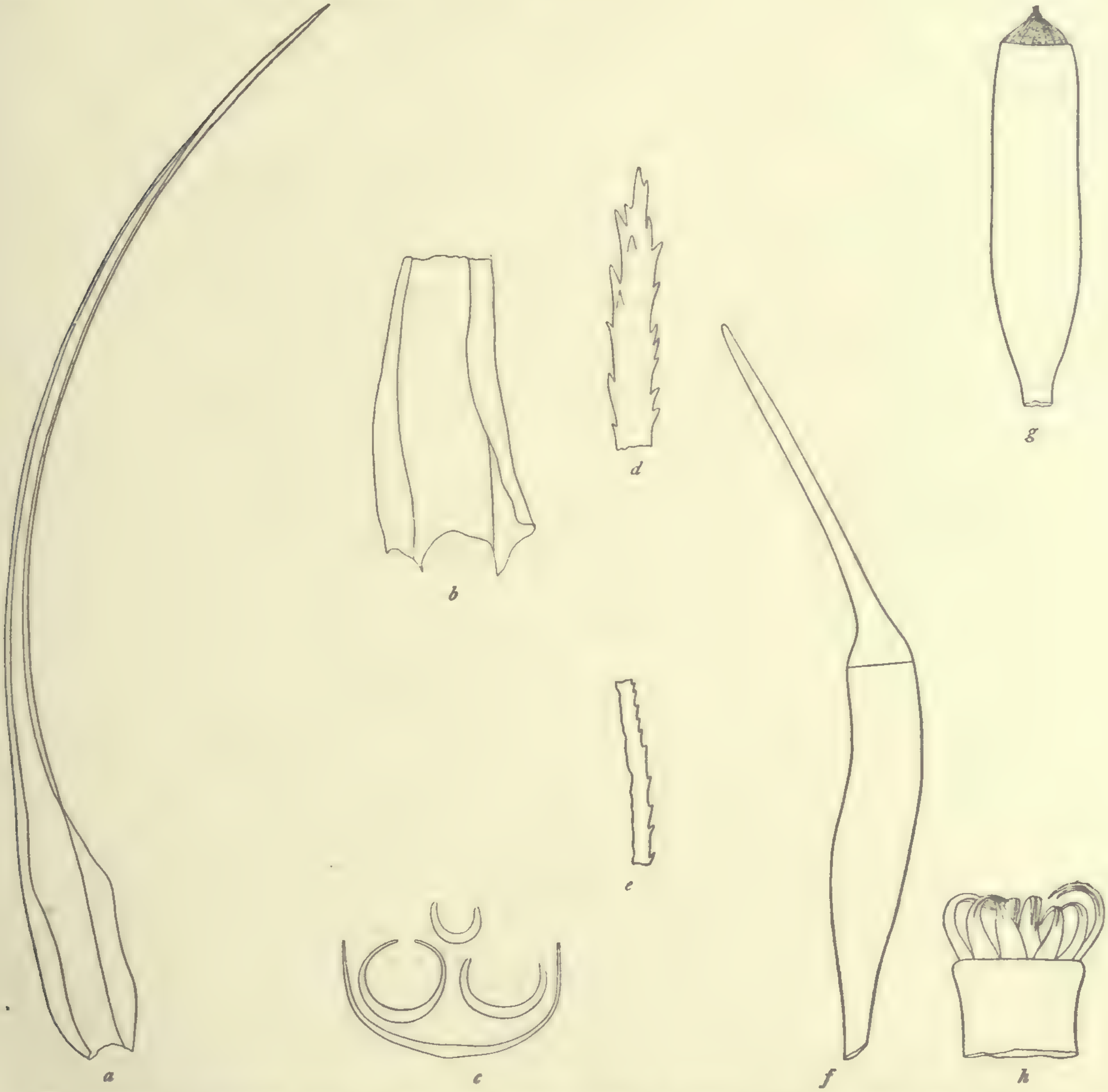
Hab. Fuegia australis.

DICRANUM CIRRHIFOLIUM Schpr. in herb.

Pl. VII, Figs. 5–7.

Dioicum; subintertexte cæspitosum, cæspitibus expansis, haud nitidis, superne viridibus vel lutescente-viridibus, ceterum ferrugineis; caulis plerumque erectus, strictus, omnino 6–7 cm. interdum usque ad 10 cm.

FIG. 3.



Dicranum cirrhifolium Schpr. in herb. *a*, folium (basi defectâ), $\frac{18}{1}$; *b*, pars basalis folii, $\frac{18}{1}$; *c*, sectiones folii, $\frac{32}{1}$; *d*, apex folii, $\frac{142}{1}$; *e*, pars superior marginalis folii, $\frac{142}{1}$; *f*, theca calyptrata humiditate, $\frac{18}{1}$; *g*, theca deoperculata humiditate, $\frac{18}{1}$; *h*, pars suprema capsulæ deoperculatæ siccitate, $\frac{32}{1}$.

altus, simplex vel parce furcatus, summitate innovando ramulosus, rigidus, robustus, fere usque ad apicem ferrugineo-tomentosus; *folia* densa, siccitate suberecta, suprema interdum subuncinata, flexuosa vel plerumque cirrhata, medio apiceque plana, humiditate e basi erecta patentia, stricta vel leviter arcuate recurvata, vix decurrentia, excavate subauriculata, auriculis in tomento occultis, e basi lata, oblonga, amplexicauli raptim contracta, longissime capillari-attenuata, usque ad 11 mm. longa et basi 1 mm. lata, canaliculata, superne interdum subconvoluta, marginibus basi medioque integerrimis, apicem versus serrulatis, summitate serratis, *nervo* valido, dilatato haud bene limitato, basi c. 0.54 mm. lato, longe infra medium folii laminam totam occupante, dorso dense papilloso-scabro; *cellulæ* pallide virides, pellucidæ, angustæ, elongatæ, parietibus interrupte et mediocriter incrassatis, alares numerosæ, distincte limitatæ, nervum attingentes, breviter rectangulæ, hyalinæ vel omnino pallide aureo-brunneæ; *bracteæ perichætii* foliis caulinis multo breviores, erectæ, cylindraceo-convolutæ, superne raptim contractæ, cuspidatæ, anguste nervosæ, nervo excurrente, cuspidem formante, cellulis angustis, elongatis, lævissimis; *setæ* singulæ binæve, erectæ, strictæ tenues, 2–3 cm. altæ, flavo-brunneæ; *theca* cylindrica, erecta, stricta, c. 3 mm. longa et 0.7 mm. crassa, olivacea, lævissima, ætate avellanea et haud rare plus minusque sulcata, siccitate paulum sub ore constricta; *dentes peristomii* rubri, 0.5 mm. alti et basi 0.075 mm. lati, longe infra medium in cruribus binis, rarissime ternis, filiformibus fissi, superne nodulosi, papilloso-scabri, inferne longitudinaliter denseque papilloso-striati, papillis minutissimis, lamellis 6–9, validis; *operculum* convexe conicum, subulate rostratum, rostro theca æquilongo vel longiori, maturitate curvato; cetera ignota. Hab. Patagonia australis in territorio fontinali fluminis Rio Chico, ubi ad basin *Nothofagi pumilionis* (Poepp. et Endl.) Blume, occurrit.

An excellent species, most nearly allied to *D. laticostatum* Card., differing from that species in its shorter stem, in the dry state its curled leaves, straight capsule, etc.

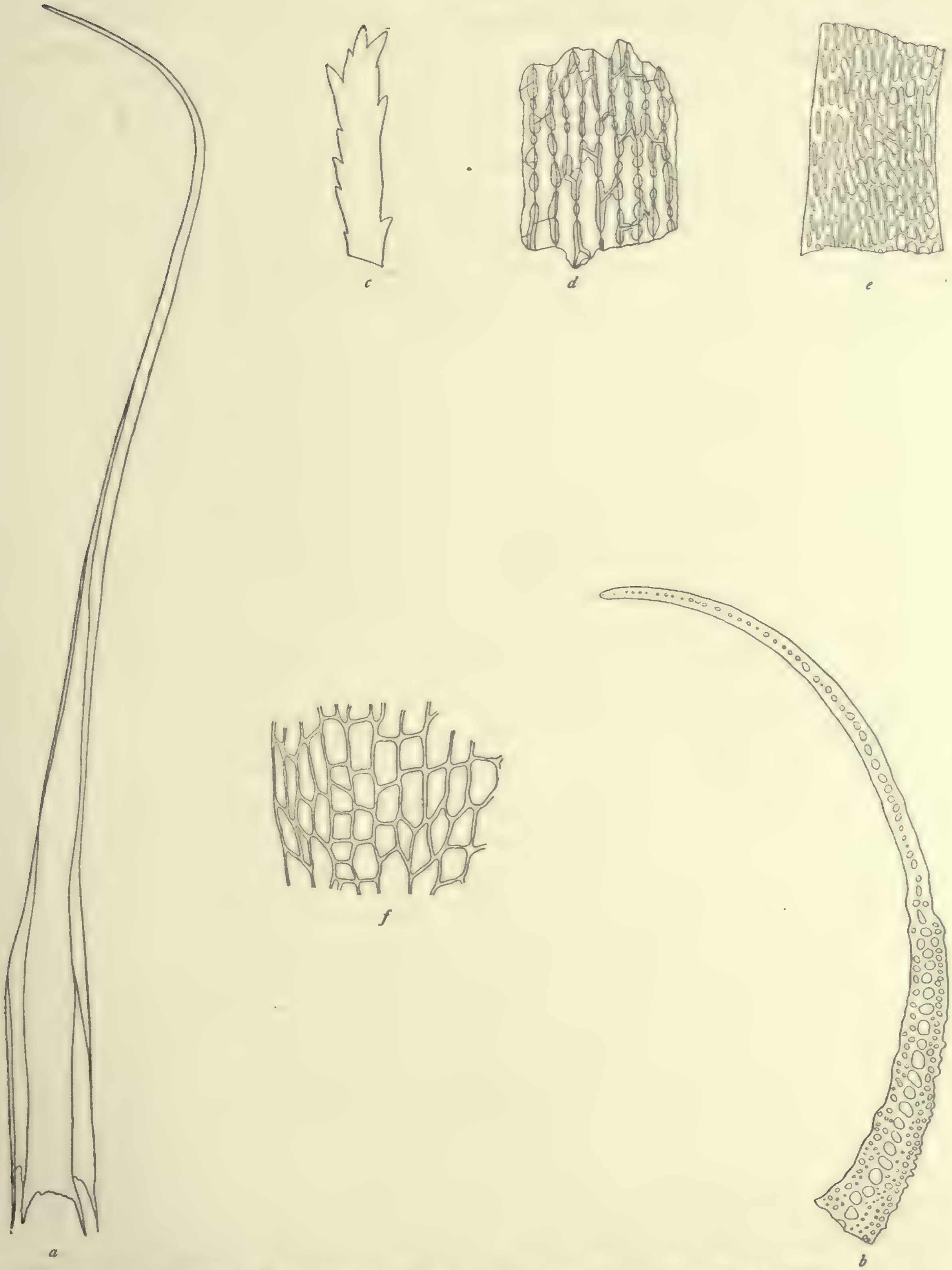
DICRANUM SCABERRIMUM Dus.

Pl. VIII, Fig. 1.

Syn. *Campylopus scaberrimus* Broth. in sched.

Dense cæspitosum, sordide flavum, fere longitudine tota dense ferrugineo-tomentosum, usque ad 1 dm. altum; *caulis* strictus, erectus, sim-

FIG. 4.



Dicranum scaberrimum Dus. *a*, folium, $\frac{18}{1}$; *b*, secto folio, $\frac{162}{1}$; *c*, apex folii, $\frac{200}{1}$; *d*, cellulæ basales, $\frac{200}{1}$; *e*, cellulæ alares, $\frac{200}{1}$; *f*, cellulæ superiores folii.

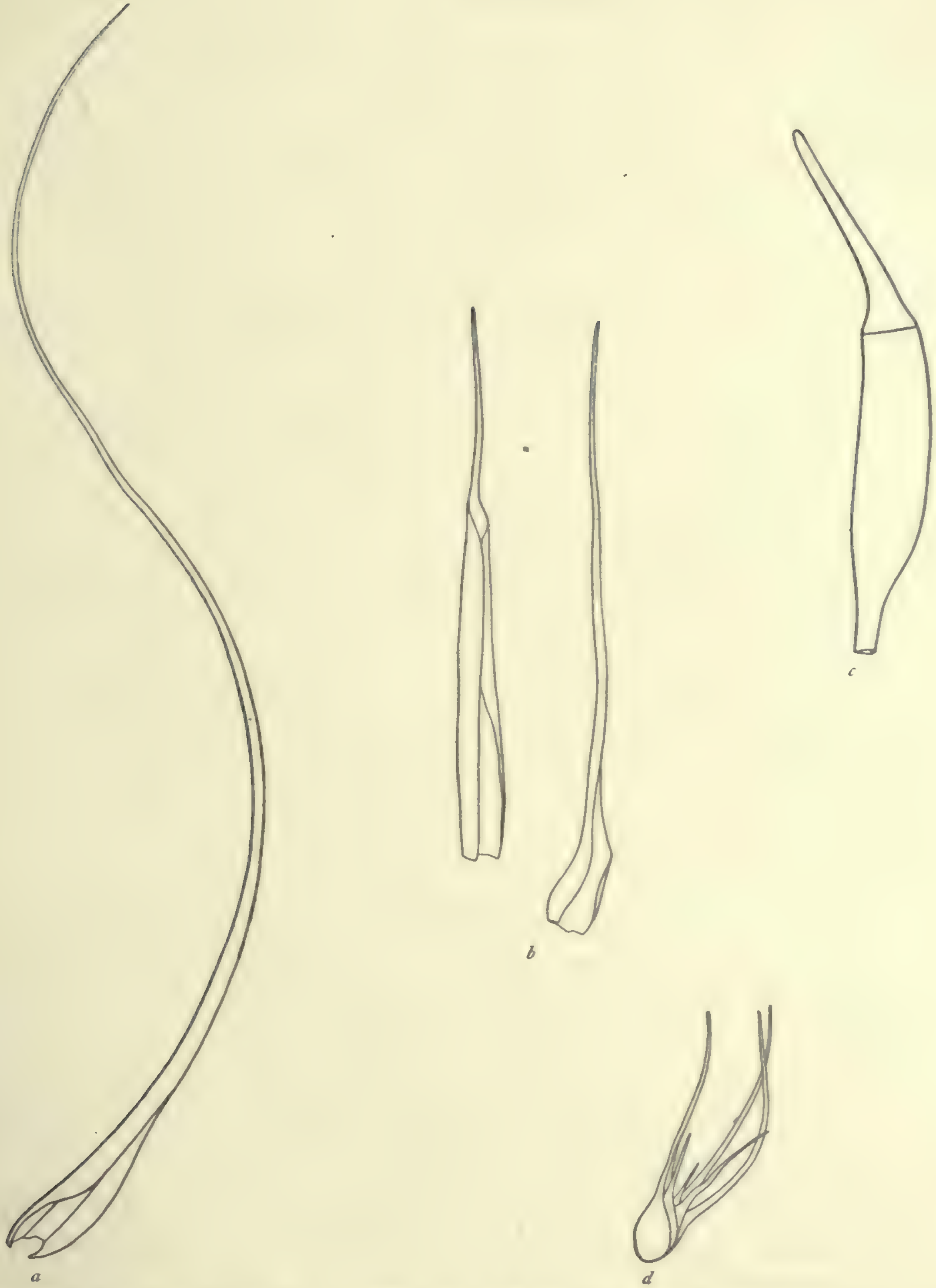
plex vel superne furcatus vel raro in ramulos paucos erectos divisus; *folia* sicca erecta, apice plus minusque arcuata vel rarissime subflexuosa, comalia sæpe subuncinata, humida erecta, fere stricta, usque ad 15 mm. longa et basi (planefacta) 2 mm. lata, linearilanceolata, haud auriculata, sensim longe subulate attenuata, subdecurrentia, marginibus apice sparsim serrulatis, ceterum integerrimis, costa latissima, depressa, basi 0.45–0.50 mm. lata, subulam totam occupante, dorso dense papillosa; *cellulæ* alares haud inflatæ, aureo-flavæ, indistincte limitatæ, subrectangulæ, cellulis basalibus paulo breviores, parietibus æqualiter subincrassatis; cellulæ basales subrectangulares, parietibus interrupte valde incrassatis; *superiores* subovales, rotundate quadratæ vel rotundate rectangulares; *marginales* angustæ, lineares; cetera ignota.

Dr. V. F. Brotherus has had the kindness to send me a specimen of a moss, collected many years ago by Cunningham in the surroundings of Sandy Point (Punta Arenas) on the Straits of Magellan. This plant, agreeing exactly with the one above described, was determined as *Campylopus scaberrimus* n. sp. According to my opinion it is, however, more correct to refer it to the genus *Dicranum* than to the genus *Campylopus.* It contains, however, only a single character, which shows the place of the plant to be amongst the Dicrana, namely the structure of the nerve. A transverse section of the leaves a little above their base shows the nerve to be composed of a middle row of wide cells, enclosed by some few rows of very small ones, as is the case with *Dicranum orthocomum* (Besch.) C. Müll., which also was previously placed in the genus *Campylopus.*

Dr. Brotherus, as well as myself, having taken notice of the preliminary report of the mosses, brought home by the Belgian Antarctic Expedition and published by Dr. J. Cardot in "Revue Bryologique," 1900, supposed the *Dicranum scaberrimum* to be identical with the *Dicranum laticostatum* Card. This supposition, however, proved incorrect. Having received the accurate description of the above-mentioned antarctic mosses, given by Cardot in the scientific report of the Belgian Antarctic Expedition, it was found at once that the two mosses in question are not identical, and that the *Dicranum scaberrimum* was an undescribed species.

It shows some characters of *Dicranum laticostatum* Card. as the broad, depressed nerve, being papillous on the dorsal side. It clearly differs, however, from that species in its longer and more robust stem, being also tomentose more densely and higher up, in its larger and erect

FIG. 5.



Dicranum dicranellatum Dusén. *a*, folium, $\frac{18}{1}$; *b*, bracteæ perichætii, $\frac{18}{1}$; *c*, capsula operculata humiditate, $\frac{18}{1}$; *d*, flos masculus, $\frac{18}{1}$.

leaves and in its uninflated and scarcely distinct alar cells. From *Dicranum rigens* Besch. it is distinguished by its papillous nerve and its alar cells. It appears to stand nearest to *Dicranum orthocomum* (Besch.) C. Müll., but differs from that species in its more robust stem which is nearly in its whole length densely tomentose, and in its much longer and more erect leaves, being all papillous on the dorsal side of the nerve.

DICRANUM DICRANELLATUM Dusén n. sp.

Pl. VIII, Figs. 2, 3.

Autoicum; dense vel interdum laxe cæspitosum, cæspitibus plerumque parvis, humilibus, lutescente viridibus, vel nitidis, inferne ferrugineis; *caulis* erectus vel adscendens, 2–3 cm. altus, simplex vel basi pauci-ramosus, summitate brevissime ramulosus, gracilis, fere ad apicem ferrugineo-tomentosus; *folia* densa, siccitate suberecta, strictiuscula vel plus minusve arcuata, suprema interdum subuncinata, humiditate patentia, strictiuscula vel leviter recurvata, e basi lineari-oblonga sensim longe capillari-attenuata, usque ad 10 mm. longa et basi 0.45 mm. lata, canaliculata, marginibus integerrimis vel apice solummodo serrulatis, *nervo* valido, lævissimo, basi c. 0.2 mm. lato, totam partem supremam folii occupante; *cellulæ* basales elongatæ, parietibus interrupte incrassatis, ceteræ ovales vel rotundatæ, alares amplæ, subquadratæ vel breviter subrectangulæ, distincte limitatæ, nervum attingentes, aureo-brunneæ; *bracteæ perichætii* erectæ, cylindraceo-convolutæ, superne raptim contractæ et capillari-attenuatæ, tenuiter nervosæ, nervo percurrente, cuspidem formante, cellulis elongatis, parietibus interrupte incrassatis; *seta* erecta, stricta, tenuis, 2–2.5 cm. alta, flavidula; *theca* cylindrica, stricta, lævissima, olivacea, vetusta pallide brunnea, c. 2 mm. longa et 0.5 mm. diam., siccitate sub ore paulum constricta; *peristomii dentes* rubri, 0.5 mm. alti et basi 0.06 mm. lati, ultra medium in cruribus binis fissis, superne subnodulari- et papilloso-scabri, inferne obsolete plicato-striati, lamellis c. 10, validis; *operculum* conicum, oblique rostratum, rostro theca fere acquilongo; cetera ignota.

Flores masculi paulum infra florem fem. dispositi, gemmiformes, in tomento occulti; folia perigonalia e basi concava, suborbiculari longe capillari-attenuata.

Hab. Fuegia australis ad Villarino.

Near to *Dicranum macropus* Kze. but differing by its completely glabrous leaf-nerve and its erect capsule.

Subfam. *DITRICHEÆ.*

Gen. DITRICHUM Timm.

Ditrichum hyalinum (Mitt.) Par.

Hab. Patagonia australis in territorio fontinali fluminis Rio Chico, ubi ad basin *Nothofagi pumilionis* (Poepp. et Endl.) Blume occurrit.

Gen. DISTICHIUM Br. Eur.

Distichium capillaceum (L.) Br. Eur.

Hab. Patagonia australis in territorio fontinali fluminis Rio Chico in terra; Fuegia australis ad Villarino.

Fam. Pottiaceæ.

Subfam. *POTTIEÆ.*

Gen. POTTIA Ehrh.

Pottia spegazziniana C. Müll.

Hab. Patagonia australis in territorio fontinali fluminis Rio Chico in terra.

Gen. BARBULA Hedw.

Barbula flagellaris Schpr.

Hab. Patagonia australis in territorio fontinali fluminis Rio Chico in truncis et ad basin arborum.

Barbula fuegiana Mitt.

Hab. Fuegia australis.

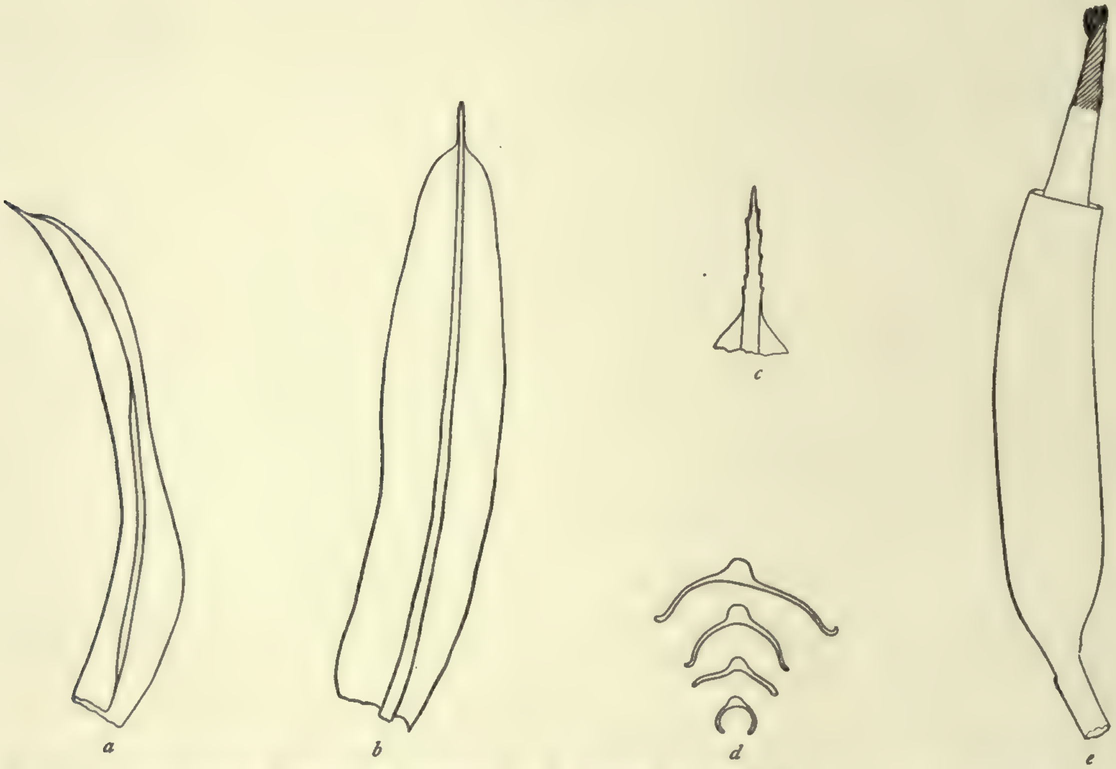
Barbula perrubiginosa Dusén, n. sp.

Pl. VIII, Fig. 4.

Synoica; densiuscula cæspitosa, cæspitibus sat expansis, summitate sordido-viridibus, ceterum rubiginosis; *caulis* robustus, usque ad 5 cm. altus, dimidio inferiore vel longitudine tota ruforadiculosus, erectus, strictus, plus minusque vel interdum fasciculatim ramosus, apice innovando ramulosus; *folia* usque ad 5 mm. longa et (deplanata) 0.9 mm.

lata, sicca suberecta, conduplicata, marginibus reflexis, plerumque incurvata, suprema etiam subcontorta humida patentia, suprema arcuate reflexa, e basi amplexicauli, haud decurrente linearia, canaliculata, marginibus papilloso-erosulis, e basi ad medium vel altius reflexis; *nervo* rubro, 0.1 mm. lato, dorso præcipue basin versus minute papilloso-scabro, excurrente, aristam rectam, leviter denticulatam vel subglabram formante; *cellulæ* basales elongatæ, rectangulæ, hyalinæ, lævissimæ, ceteræ minutissimæ, c. 0.011 mm. magnæ, omnino subrotundate quadratæ, obscuræ, minutissime denseque papillosæ, parietibus incrassatis; *bracteæ perichætii* foliis caulinis similes. *Seta* c. 1 cm. alta; stricta, purpurea, lævissima, nitida, sinistrorsum torta; *theca* cylindrica, subcurvata, atropurpurea, c. 5 mm. longa et 0.6 mm. crassa, siccitate nitida leviterque rugosa; *annulus* simplex; *peristomium* c. 1.9 mm. altum, tubulosum, tubo 0.63 mm. alto, inferne albescente, superne purpureo, ubique minutissime et densissime papilloso, indistincte tessellato, cruribus filiformibus, liberis, basi vix binatis, 0.013 mm. crassis, purpureis, fere bis contortis, densissime papillosis; *opercu-*

FIG. 6.



Barbula perrubiginosa Dusén. *a*, folium, $\frac{18}{1}$; *b*, folium planefactum, $\frac{18}{1}$; *c*, apex folii, $\frac{45}{1}$; *d*, sectiones folii, $\frac{82}{1}$; *e*, theca humiditate, $\frac{18}{1}$.

lum alte conicum, breviter apiculatum; *sporæ* olivaceæ, lævissimæ, c. 0.08 mm. magnæ; paraphyses numerosi, aurei, sursum sensim dilatata, cellula conica vel hemisphærica terminata.

Hab. Patagonia australis in territorio fontinali fluminis Rio Chico in truncis ramisque arborum.

Closely related to *Barbula conotricha* Müll.; differing from that species in its more robust stem, in the nerve of the lower part of the leaves being usually papillous on the dorsal side, in its smaller leaf-cells and its non-cohering peristomial branches.

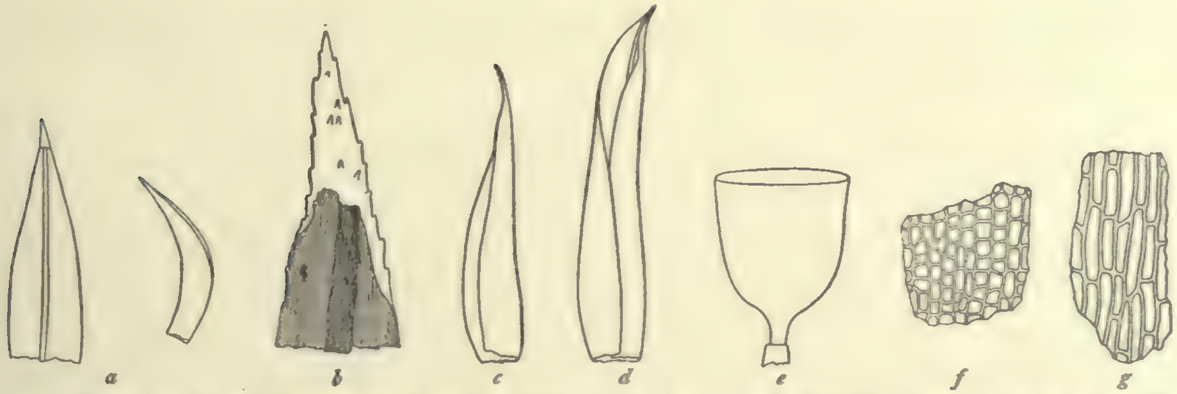
Fam. Grimmiaceæ.

Gen. GRIMMIA Ehrh.

Grimmia fallax Dusén n. sp.

Pl. VIII, Figs. 5, 6.

Fig. 7.



Grimmia fallax Dusén. *a*, folia, $\frac{18}{1}$; *b*, apex folii, $\frac{87}{1}$; *c*, *d*, bracteæ perichætii, $\frac{18}{1}$; *e*, capsula vetusta humiditate, $\frac{18}{1}$; *f*, cellulæ apicales folii, $\frac{200}{1}$; *g*, cellulæ basales, $\frac{200}{1}$.

Autoica, latiuscule pulvinatim cæspitosa, cæspitibus summitate flavidulis, ceterum atro-brunneis; *caulis* usque ad 2.5 cm. longus, gracilis, rigidus, iterum iterumque dichotome et fastigiatim ramosus; *folia* sicca appressa, madefacta primo reflectentia, deinde recurvate patentia, e basi amplexicauli, haud decurrente, fere lineari oblongo-lanceolata, usque ad 2 mm. longa et 0.45 mm. lata, medio et superne carinata, omnino suprema tantum apice hyalino sat brevi complanato, denticulato, plus minusque decurrente ornata, marginibus integerrimis, usque ad apicem reflexis, *nervo* basi 0.06 mm. crasso, rubro percurrente; *cellulæ* basales rectangulæ, parietibus strictis, paulum incrassatis, ceteræ omnino quadratæ, c. 0.008 mm. magnæ, parietibus incrassatis subflexuosis, marginales superne saltem bistratosæ; *bracteæ perichætii* foliis caulinis multo majores, flavo-virides, erectæ, subconvolutæ, apice hyalino longiore præditæ, cellulis in dimidio inferiore bractearum rectangulis, subpellucidis, ceterum foliis caulinis similibus; *seta* brevissima, 0.2–0.35 mm. alta; *theca* brunnea, breviter urnacea, c. 1.1 mm. longa et 0.9 mm. crassa, macrostoma, pachyderma; *cellulæ exothecii* paulum incrassatæ, marginales parvæ, 2–3-seriatæ, transversaliter rotundate subrectangulæ, ceteræ omnino rotundate rectangulæ, rotundate quadratis vel subrotundis mixtæ; *peristomii dentes* aurantiaci, late lanceolati, c. 0.4 mm. alti et 0.14 mm. lati, subobtusi vel acuti, medio et superne hic illic longitudinaliter perforati, interdum apice paulum fissi, dense papillosi graciliterque trabeculati; *operculum* convexum, rostro brevi, crasso, obliquo coronatum; *sporæ* c. 0.013 mm. magnæ, pallide brunneæ, lævissimæ.

Hab. Patagonia australis, ubi verisimiliter in territorio fontinali fluminis Rio Chico in saxis lecta est.

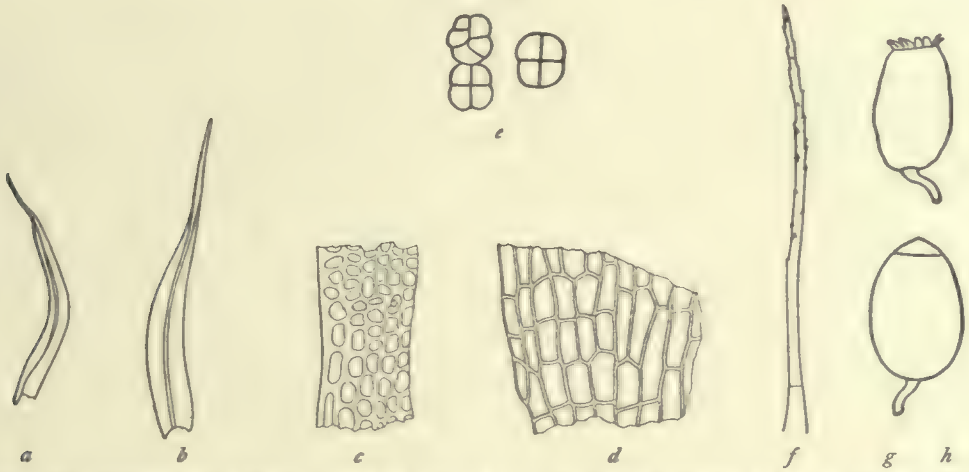
Closely allied to *Grimmia apocarpa* (L.) Hedw., differing in the leaves having narrower basal part, smooth basal cells and shorter broader and complanate apex, in the shorter and broader capsule, in the peristomial teeth being broader in their upper part and usually obtuse, and in the less regular cells of the exothecium.

GRIMMIA MACROPULVINATA Dusén n. sp.

Pl. VIII, Fig. 7.

Autoica; dense pulvinatim cæspitosa, cæspitibus griseoviridibus, usque ad 5 cm. diam., humilibus; *caulis* vix 1 cm. altus, simplex vel dichotome ramosus, haud raro fasciculatim ramulosus, infima basi tantum radiculosus; *folia* densiuscula, usque ad 1.5 mm. longa et 0.4 mm. lata, siccitate appressa, stricta, suprema interdum subspiraliter torta, humiditate patula strictaque, e basi sublineari vel subovali lanceolate elongata, sensim in pilo hyalino, remote denticulato, folio multo breviore, stricte vel interdum subflexuoso producta, canaliculata, apicem versus carinata, marginibus integerrimis, haud reflexis; *nervo* basi c. 0.04 mm. crasso, apicem versus tantum dorso paulum prominente exarata; *cellulæ* basales pellucidæ, vix pachydermaticæ, juxta nervum sitæ rectangulæ, juxta marginem sitæ quadratæ, ceteræ omnino quadratæ, c. 0.008 mm. magnæ, chlorophyllosæ, obscuræ, parietibus incrassatis; *bracteæ perichætii* erectæ, convolutæ, foliis caulinis fere duplo majores et multo longius hyalino-cuspidatæ, cellulis dimidii inferioris bractearum rectangulis, pellucidis, ceterum foliis caulinis similes; *seta* stricta vel apice subflexuosa, siccitate dextrorsum torta, c. 1.45 mm. alta; *theca* ovalis, c. 1 mm. longa et 0.7 mm. crassa, leptoderma, olivacea, vetusta pallide brunnea, erecta, bracteas vix vel paulum superans siccitate irregulariter subsulcata; *peristomium* rubrum, dentibus siccitate subreflexis, c. 0.22 mm. altis et 0.06 mm. latis, late lanceolatis, apice 2–4-fissis, trabeculatis, dense papillosis; *operculum* humiliter conicum, haud rostratum; *sporæ* 0.010–0.013 mm. magnæ, lævissimæ.

Fig. 8.



Grimmia macropulvinata Dusén. *a*, *b*, folia, $\frac{18}{1}$; *c*, cellulæ apicales, $\frac{200}{1}$; *d*, cellulæ basales, $\frac{200}{1}$; *e*. gemmæ, $\frac{200}{1}$; *f*, apex bracteæ, $\frac{45}{1}$; *g*, theca vetusta humiditate, $\frac{18}{1}$; *h*, capsula calyptrata humiditate, $\frac{18}{1}$.

Flores fem. paraphysibus hyalinis, filamentosis, paucis præditi.

Hab. Patagonia australis, ubi species verisimiliter in territorio fontinali fluminis Rio Chico in saxis lecta est.

Resembling *Grimmia pulvinata* but growing in much larger tufts and well distinguished from that species by the erostrate operculum. Nearly allied also to *G. humilis* Mitt., to judge by the diagnosis, but differing by its upper usually quadrate cells.

Gen. RHACOMITRIUM Brid.

Rhacomitrium lanuginosum (Hedw.) Brid.

Hab. Patagonia australis in territorio fontinali fluminis Rio Chico in rupibus.

Rhacomitrium lævigatum (Mitt.) Jaeg.

Hab. speciei; Patagonia australis, ubi verisimiliter in territorio fontinali fluminis Rio Chico lecta est.

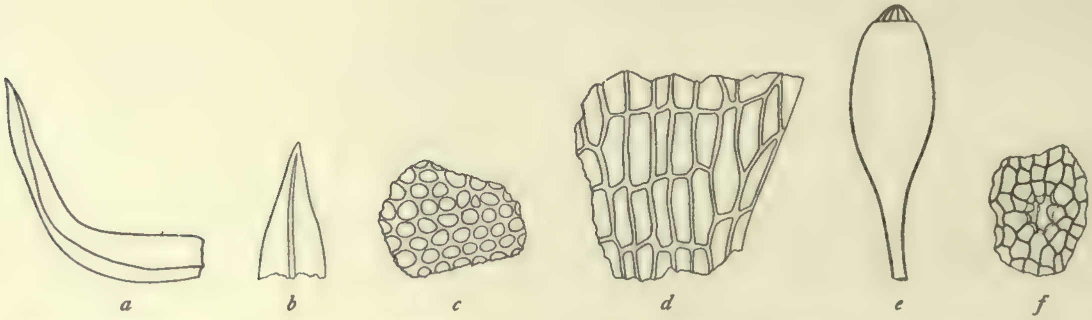
Fam. Orthotrichaceæ.

Gen. ORTHOTRICHUM Hedw.

Orthotrichum macloskii Dusén n. sp.

Pl. VIII, Figs. 8–11.

Fig. 9.



Orthotrichum macloskii Dusén. *a*, folium, $\frac{18}{1}$; *b*, apex folii, $\frac{45}{1}$; *c*, cellulæ apicales, $\frac{200}{1}$; *d*, cellulæ basales, $\frac{200}{1}$; *e*, capsula humiditate, $\frac{18}{1}$; *f*, cryptostoma, $\frac{87}{1}$.

Autoicum, cryptostomaticum; dense cæspitosum, humillimum, flavo-viride; *caulis* erectus, usque ad 8 mm. altus, fere usque ad apicem rufo-radiculosus; *folia* lineari-lanceolata, siccitate suberecta, stricta, humiditate e basi erecta patentia, usque ad 2.7 mm. longa et 0.5–0.6 mm. lata, superne saltem carinata, marginibus reflexis, papilloso-erosulis, carinate nervosa, *nervo* basi 0.06 mm. crasso, in apicem vix excurrente; *cellulæ* basales rectangulæ, parietibus vix incrassatis, lævissimis, medianæ rotundate subquadratæ, apicales rotundatæ, 0.010–0.014 mm. magnæ, parietibus incrassatis et valde papillosis; *bracteæ, perichætii* foliis caulinis similes, sed paulum majores; *seta* brevissima, c. 2 mm. longa et 0.14 mm. crassa; *theca* humiditate ovalis, lævissima, siccitate fere cylindrica, profunde 8-sulcata, 1.5–1.8 mm. longa et 0.6 mm. crassa, plerumque bracteas sat longe superans, flavo-viridis, subnitens, ætate pallide brunnea; *peristomium* pallide flavum, *externum* dentibus 8, bigeminatis, c. 0.25 mm. altis et 0.12 mm. latis, integris, obtusis, dense minutissime papillosis, siccitate reflexis, ad thecam appressis, *internum* et dentibus perfectis 8 et dentibus rudimentariis totidem præditum, his filiformibus; dentibus peristomii externi paulum brevioribus, laxe nodulosis, lævissimis, basi dilatatis, siccitate arcuatim inflexis, illis humillimis; *membrana basilari* brevissima; *operculum* paulum convexum, pallide flavum, margine aurantiaco, rostro brevi, crasso, subobliquo, rotundate obtuso coronatum; *calyptra* sulcata, glaberrima, aureo-nitens, oblongo-campanulata; *sporæ* 0.016–0.020 mm. magnæ, papillosæ.

Flos masc. gemmiformis ad basin floris fem. dispositus, bracteis ovatis, concavis, subapiculatis, nervo infra apicem evanido, cellulis omnino subrhombeis, lævissimis, parietibus haud vel vix incrassatis.

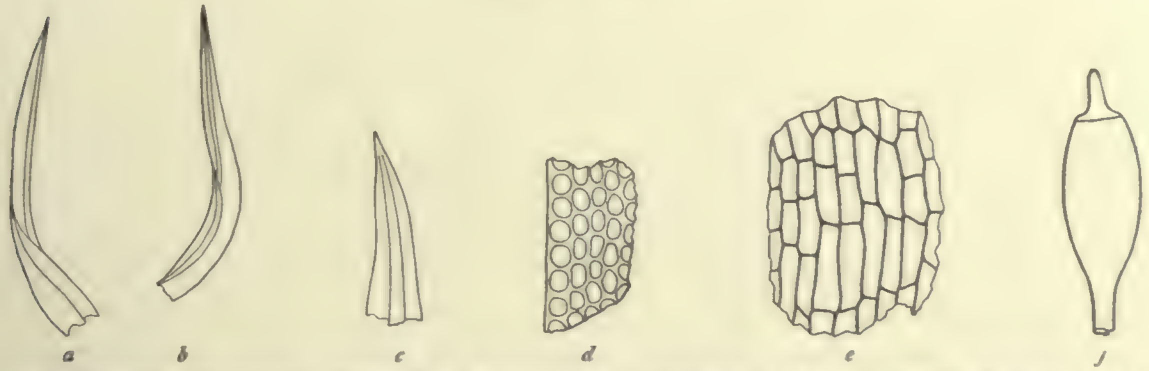
Hab. speciei, Patagonia australis in truncis arborum, ubi verisimiliter in territorio fontinali fluminis Rio Chico lecta est.

An elegant little species, very distinct and easily recognized by its rudimentary inner peristomial teeth, interposed between the perfect ones, and by its shining hairless calyptra. In size it resembles *Orthotrichum pumilium* Sw. and *tenellum* Bruch.

ORTHOTRICHUM COMPACTUM Dusén n. sp.

Pl. IX, Figs. 1–3.

FIG. 10.



Orthotrichum compactum Dusén. *a*, *b*, folia, $\frac{18}{1}$; *c*, apex folii, $\frac{45}{1}$; *d*, cellulæ apicules, $\frac{200}{1}$; *e*, cellulæ basales juxta nervum sitæ, $\frac{200}{1}$; *f*, capsula calyptrata humiditate, $\frac{18}{1}$.

Autoicum, *cryptostomaticum;* densissime et intricate cæspitosum, cæspitibus humillimis, summitate flavo-viridibus, ceterum fuscis; *caulis* erectus, longitudine tota radiculosus, apice ramulosus; folia densissime conferta, lineari-lanceolata, c. 1.8 mm. longa et 0.35 mm. lata siccitate appressa, stricta, humiditate e basi erecta patentia, carinata, marginibus vulgo planis, rarissime plus minusque reflexis, carinate nervosa, *nervo* basi 0.06 mm. crasso, infra apicem desinente; cellulæ lævissimæ, basales rectangulæ, medianæ rotundate rectangulæ vel rotundate quadratæ, apicales ovales vel rotundatæ, c. 0.013 mm. magnæ, parietibus omnino valde incrassatis; *bracteæ perichætii* foliis caulinis similes; *seta* c. 1.4 mm. alta; *theca* oblonga-ovalis, c. 1.5 mm. longa et 0.55 mm. crassa, siccitate 8-sulcata, pallide flava; *peristomium* pallide flavum, *externum* dentibus 8, bigemmatis, 0.19 mm. altis et basi 0.1 mm. latis, minutissime papillosis, siccitate valde reflexis, ad thecam appressis, *internum* dentibus 8, dentibus endostomii æquilongis, subulatis, lævissimis; *operculum* depresse conicum, rostro crasso, diametro capsulæ breviore, recto, obtuso coronatum; sporæ c. 0.016 mm. magnæ, papillosæ.

Hab. speciei, Patagonia australis in truncis arborum, ubi verisimiliter in territorio fontinali fluminis Rio Chico lecta est. Resembling *Orthotrichum macloskii* Dusén, but more densely tufted, differing from that species by the absence of rudimentary inner peristomial teeth, interposed between the perfect ones, and by the non-papillose cells of the leaves.

ORTHOTRICHUM RUPESTRE Schleich.

Hab. Patagonia australis in territorio fontinali fluminis Rio Chico, ubi in consortio *Barbulæ flagellaris* Schpr. ad basin arborum occurrit.

Gen. ULOTA.

ULOTA HAMATA Dusén n. sp.

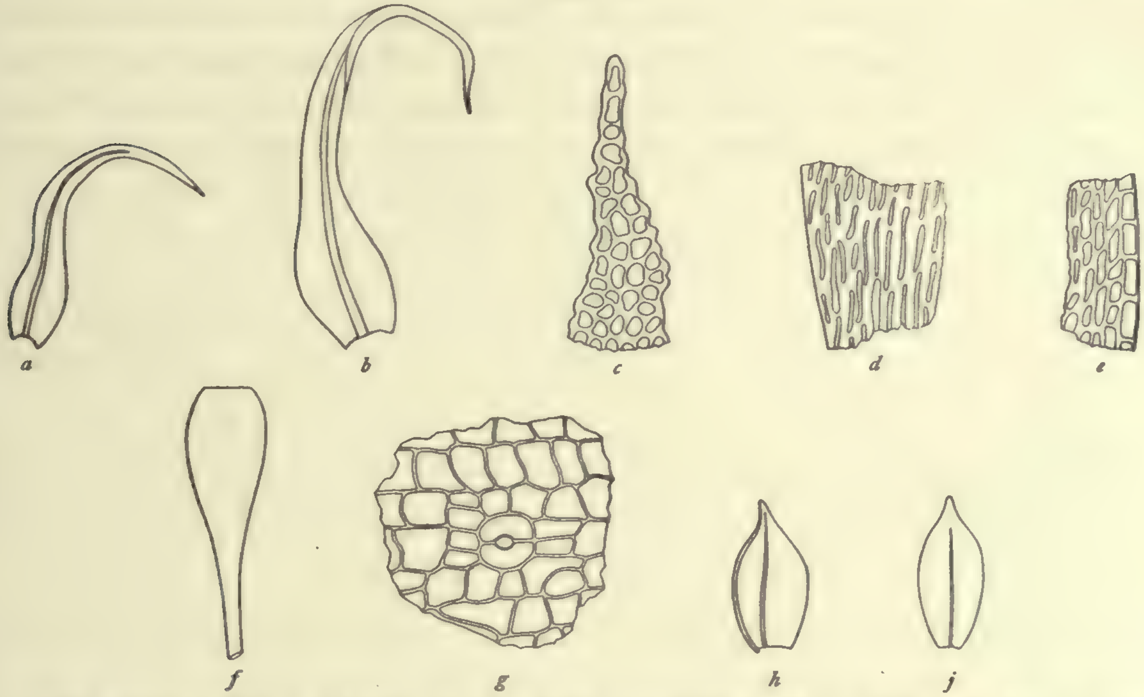
Pl. IX, Fig. 4.

Autoica, phanerostomatica; dense cæspitosa, humilis, lutescente viridis; *caulis* repens, sat dense ramosus, rami erecti plerumque simplices, usque ad 6 mm. alti; *folia* dense conferta, subuncinati, omnino apice hamata, siccitate erecta vel suberecta, vix crispata, humiditate patentia, c. 1.8 mm. longa et basi 0.33 mm. lata, e basi dilatata, breviter ovali, concava elongate lanceolata, subcanaliculata, emarginata, marginibus planis, plus minusque distincte crenulatis; *nervo* basi 0.02 mm. crasso, longe infra apicem evanido; *cellulæ* parietibus valde incrassatis, pellucidæ, basales anguste elongatæ, marginem versus breviter rectangulæ, ceteræ rotundatæ, c. 0.135 mm. magnæ, subpapillosæ; *bracteæ perichætii* foliis caulinis similes, sed paulum majores; *seta* stricta, usque ad 5 mm. alta; *theca* (vetusta) humiditate clavata, c. 1.4 mm. longa et 0.6 mm. crassa; *calyptra* juventute rubella, pilis hyalinis appressis vestita; cetera ignota.

Hab. Patagonia australis in truncis arborum.

Nearer to *Ulota fulvella* Mitt. than *Ulota fuegiana* Mitt., differing in its hamate leaves, being neither twisted nor crisp in the dry state, in its clavate capsule and reddish calyptra with appressed hyaline, inarticulated hairs.

FIG. 11.



Ulota hamata Dusén. *a*, folium, $\frac{32}{1}$; *b*, folium peribracteale, $\frac{32}{1}$; *c*, apex folii, $\frac{200}{1}$; *d*, cellulæ basales, $\frac{200}{1}$; *e*, cellulæ marginales e parte basali, $\frac{200}{1}$; *f*, theca vetusta humiditate, $\frac{17}{1}$; *g*, phanerostoma, $\frac{200}{1}$; *h*, *j*, folia perigonialia, $\frac{32}{1}$.

ULOTA FULVELLA Mitt.

Hab. Fuegia australis ad Lapataia et ad Villarino in ramulis.

Gen. MACROMITRIUM Brid.

MACROMITRIUM TENAX C. Müll.

Hab. Fuegia australis.

MACROMITRIUM BIFASCICULARE C. Müll. in herb.

Pl. IX, Fig. 5.

Dense cæspitosum, cæspitibus expansis, summitate flavescentibus, ceterum atro-rubiginosis; *caulis* repens, dense ramosus, ramis erectis,

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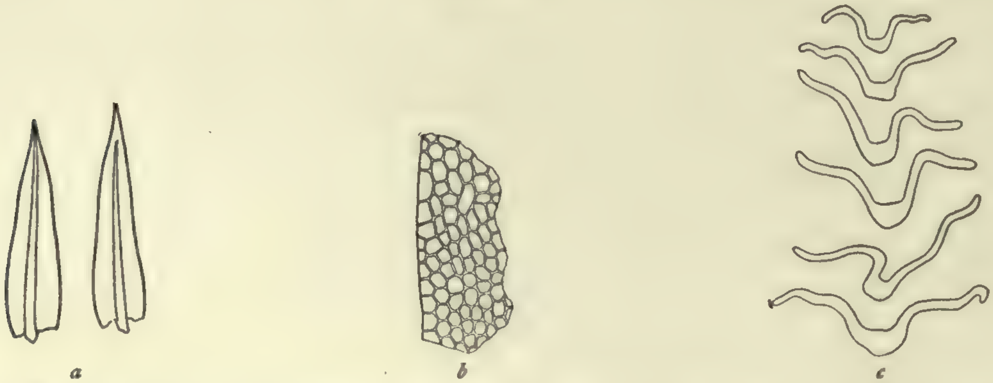
robustiusculis, strictis parallele confertis, usque ad 3.5 cm. altis, iterum iterumque bifurcatis vel apice saltem fasciculatim et fastigiatim ramulosis; *folia* dense conferta, usque ad 2.4 mm. longa et 0.45 mm. lata, siccitate appressa, suprema subspiraliter torta, humiditate patula, imbricata, stricta, lanceolata, acutissima, integerrima, haud decurrentia, carinata, plerumque utroque latere subplane replicata, marginibus planis vel rare subreflexis, *nervo* rubro, valido, basi 0.06 mm. crasso, lævissimo, cum apice desinente; cellulæ lævissimæ, parietibus valde incrassatis, basales rectangulæ, apicales minutissimæ, 0.005–0.008 mm. magnæ, omnino hexagonæ; cetera ignota.

FIG. 12.



Macromitrium bifasciculare C. Müll. *a*, folia, $\frac{17}{1}$; *b*, cellulæ apicales, $\frac{200}{1}$; *c*, sectiones foliorum, $\frac{87}{1}$.

Hab. Fuegia australis ad Villarino in rupibus litoreis (?).

Nearest to *Macromitrium saddleanum* Besch., but much lower, more densely tufted and with denser ramification, besides differing from that species in its non-decurrent leaves and its excurrent leaf-nerve. The upper cells, originally hexagonal, are in the older leaves by hard incrassa- of the membranes very small, oval or nearly round.

Gen. ZYGODON Hook. et Tayl.

ZYGODON CURVICAULIS Dusén n. sp.

Pl. IX, Figs. 6, 7.

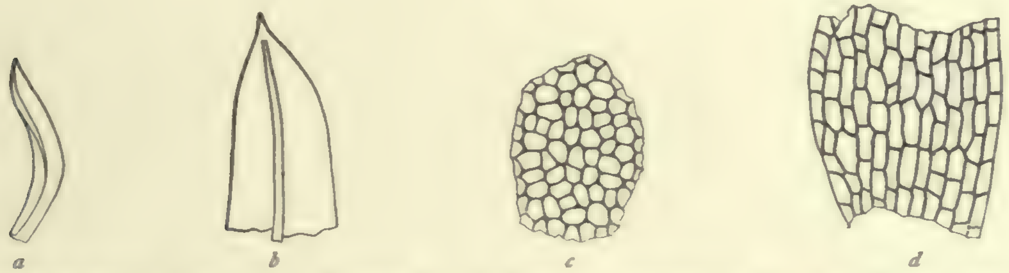
Plus minusque dense cæspitosus, cæspitibus parvis, lutescenti-viridibus, humillimis; *caulis* gracilis, usque ad 1.5 cm. altus, erectus vel adscendens, plerumque vage curvatus, apice haud rare subuncinatus, simplex vel parce ramosus, tota longitudine radiculosus, radiculis atropurpureis, minutissime papillosis, illis, qui ex axillis excedunt lævissimis et brevissimis, gemmis

ovalibus vel subclavatis terminatis; folia siccitate suberecta, incurvata, marginibus subreflexis, suprema saltem plerumque subsecunda, madefacta raptim reflectentia, e basi erecta subsquarrose reflexa, usque ad 1.6 mm. longa et 0.4 mm. lata, lineari-lanceolata, carinata, marginibus planis vel subrecurvatis, papillis vestitis, itaque crenulato-erosulis, nervo basi 0.06 mm. crasso, rubro, infra summum apicem evanescente, lævissimo; *cellulæ* basales breviter rectangulæ, subpellucidæ, ceteræ omnino rotundatæ, minutissimæ, c. 0.013 mm. magnæ obscuræ, utroque latere dense papillosæ; cetera ignota.

Hab. species Patagonia australis in truncis arborum, ubi verisimiliter in territorio fontinali fluminis Rio Chico lecta est.

Nearly related to *Zygodon brownii* Schwaegr. and of quite the same appearance as that species. There is very little difference between the sterile plants of both species. *Zygodon curvicaulis* has perhaps less crowded and a little less acute leaves than *Z. brownii.* The most considerable difference, however, is shown by the gemmæ. The *Z. curvicaulis* has oval or subclavate ones, with transverse membranes of the cells, and disposed at the end of *radicels*, or arising from the axils. The gemmæ of *Z. brownii* on the contrary are quite globular with radiate cell-membranes and seem to have their origin from the lower part of the leaf-nerve.

FIG. 13.



Zygodon curvicaulis Dusén. *a*, folium, $\frac{17}{1}$; *b*, folium planefactum, $\frac{17}{1}$; *c*, cellulæ apicales, $\frac{200}{1}$; *d*, cellulæ basales, $\frac{200}{1}$.

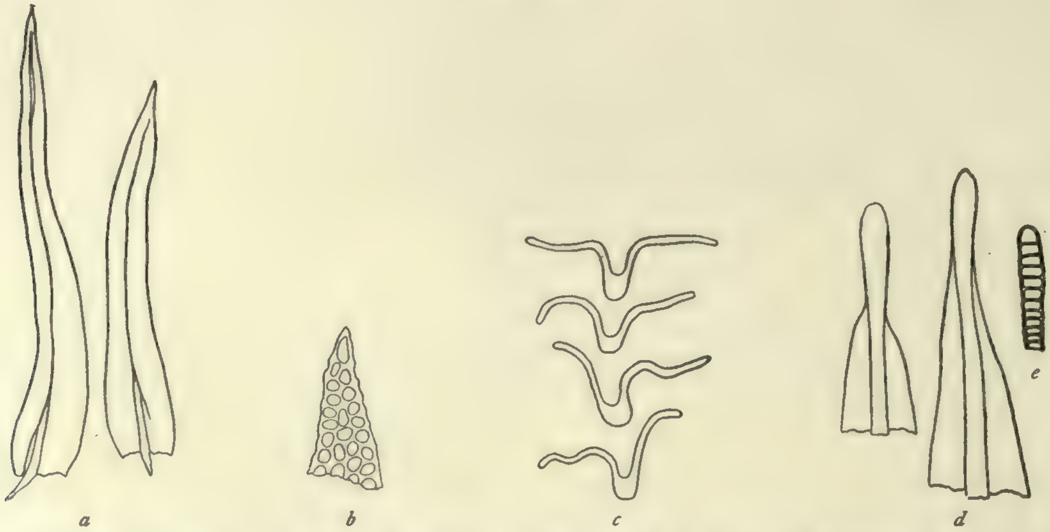
Resembling also *Zygodon intermedius* Br. et Schpr., but differs in its more robust and papillous rhizoides. The fruiting plant will probably give other differing characteristics.

ZYGODON HATCHERI Dusén n. sp.

Pl. IX, Figs. 8, 9.

Dioicus (?); densiuscule pulvinatim cæspitosus, sordido-viridis; *caulis* erectus, strictus, usque and 2 cm. altus, inferne defoliatus vel foliis marcidis plus minusque fragmentariis obtectus, fere tota longitudine radiculosus radiculis atropurpureis, lævissimis, simplex vel parce bifurcatus, summitate ob innovationes tumescens; *folia* sursum sensim majora et densiora, siccitate suberecta, crispata, madefacta raptim reflectentia, denique patula et stricta, lanceolata, usque ad 3.5 mm. longa et 0.7 mm. lata, acutissima, percarinata, omnino uno latere, interdum utroque latere genuflexa, marginibus planis, integerrimis vel apicem versus subcrenulatis, nervo basi 0.05–0.06 mm. crasso, vel infra apicem evanido vel excurrente, parte excedente subtumido; *cellulæ* basales lævissimæ, parietibus incrassatis, ad nervum sitæ anguste elongatæ, ad marginem sitæ multo breviores, fere quadratæ, ceteræ dorso subpapillosæ, parietibus valde incrassatis, 0.008–0.011 mm. magnæ, medianæ subangulatæ, apicales omnino rotundatæ; cetera ignota.

FIG. 14.



Zygodon hatcheri Dusén. *a*, folia, $\frac{18}{1}$; *b*, apex folii, $\frac{200}{1}$; *c*, sectiones, foliorum, $\frac{62}{1}$; *d*, apices foliorum, $\frac{47}{1}$; *e*, gemma, $\frac{87}{1}$.

Hab. speciei Patagonia australis, ubi verisimiliter in territorio fontinali fluminis Rio Chico lecta est.

A very distinct species, marked by its leaves, crisp in the dry state, and especially by its excurrent leaf-nerve, tumid in its uppermost part.

It can scarcely be doubted that the numerous cylindrical gemmæ, composed each of 4–8 uniseriate cells, which were found in the tufts, belong to the plant and were originally situated on the excurrent part of the leaf-nerve.

Fam. FUNARIACEÆ.

Gen. FUNARIA Schreb.

FUNARIA HYGROMETRICA (L.) Hedw.

Hab. Fuegia australis ad Lapataia in terra.

Fam. BRYACEÆ.

Gen. LEPTOBRYUM Schpr.

LEPTOBRYUM PYRIFORME (L.) Schpr.

Hab. Patagonia australis in territorio fontinali fluminis Rio Chico in paludosis.

LEPTOBRYUM POTTIACEUM Dusén n. sp.

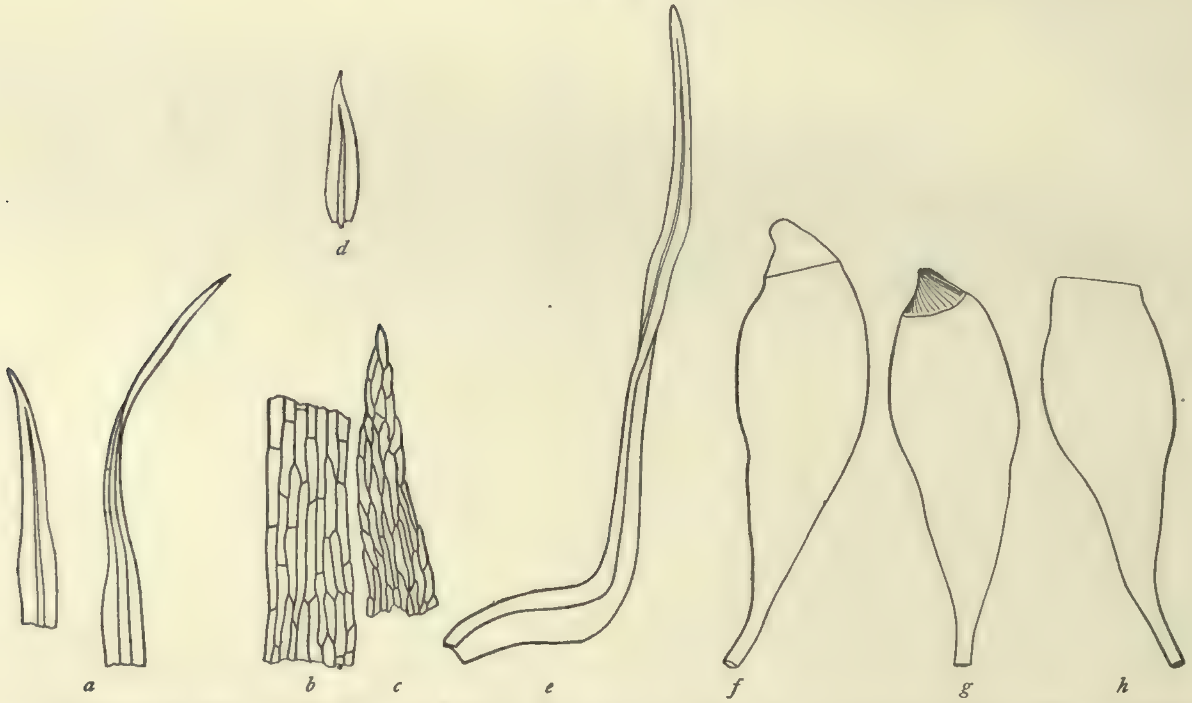
Pl. IX, Figs. 10–12.

Dioicum; vel aliis muscis intermixtum vel dense cæspitosum, cæspitibus expansis, inferne fuscis, superne lutescente viridibus, nitidis.

PLANTA FEMINEA. *Caulis* simplex, gracillimus, strictus, usque ad 1.5 cm. altus; folia inferiora et mediana remota, parva, vix 2 mm. longa, lineari-lanceolata vel linearia, superiora raptim longiora, elongate attenuata, usque ad 5 mm. longa et basi 0.35 mm. lata, haud decurrentia, siccitate plerumque erecta, humiditate e basi erecta arcuato-recurvata, basi medioque canaliculata, apicem versus plana, marginibus planis, integerrimis vel superne ob cellulas prominentes remote subserrulatis, *nervo* rubro, valido, basi c. 0.09 mm. crasso, stricto, infra summum apicem evanido; *cellulæ* flavæ, pellucidæ, apicales elongate subrhombeæ, ceteræ elongatæ, omnino rectangulæ; *bracteæ perichætii* foliis caulinis similes, sed supremis paulum longiores; *seta* tenuis, elongata, usque ad 3 cm. alta, fusco-rubra, nitida, flexuosa; *theca* subpyriformis asymmetrica, erecta, castanea, nitida, macrostoma, ore obliquo; *peristomium* pallide flavum; *dentes exostomii* lanceolati, c. 0.36 mm. alti et basi 0.064 mm. lati, inferne coaliti, linea divisurali distincta, inferne medioque minutissime papillosi, superne papillis subremotioribus et subvalidioribus ornati; lamellis paucis 8–10 instructi; *dentes endostomii* dentibus exostomii æquilongi, hyalini, lævissimi, fere ad apicem longitudinaliter perforati . . .; *operculum* conicum, apice brevissimo, crasso, truncato coronatum; *sporæ* rotundæ, c. 0.028 mm. magnæ, lævissimæ.

Planta muscula. *Caulis* simplex vel pauci-ramosus, gracillimus, e basi ad medium radiculosus, radiculis atropurpureis, longe deorsum foliatus, *foliis* iis medianis plantæ femineæ similibus; *flores* terminales, discoidei; *bracteæ perigonii* e basi erecta sat raptim attenuata, valde elongata, usque ad 6 mm. longa, arcuata recurvata vel patentissima, *nervo* valido, sat longe infra apicem evanido; paraphyses numerosi aurei, superne paulum crassiores, plerumque acutiusculi: antheridia fere cylindrica.

Fig. 15.



Leptobryum pottiaceum Dusén. *a*, folia mediana plantæ fem., $\frac{18}{1}$; *b*, cellulæ basales, $\frac{87}{1}$; *c*, cellulæ apicales, $\frac{87}{1}$; *d*, folium plantæ masc., $\frac{18}{1}$; *e*, folium perigoniale a latere visum, $\frac{18}{1}$; *f*, capsula operculata humiditate, $\frac{18}{1}$; *g*, capsula deoperculata humiditate, $\frac{18}{1}$; *h*, capsula deoperculata siccitate, $\frac{18}{1}$.

Hab. Patagonia australis in territorio fontinali fluminis Rio Chico in truncis putridis et in terra.

Fuegia australis ad Lapataia in terra.

Well distinguished from *Leptobryum pyriforme* (Hedw.) Schpr. as well as from *Leptobryum sericeum* from Tasmania, being marked by its long seta and erect, comparatively long, unsymmetrical, dark brown and shining capsule.

Gen. BRYUM Dill.

BRYUM BIMUM Schreb.

Hab. Patagonia australis in territorio fontinali fluminis Rio Chico in terra paludosa.

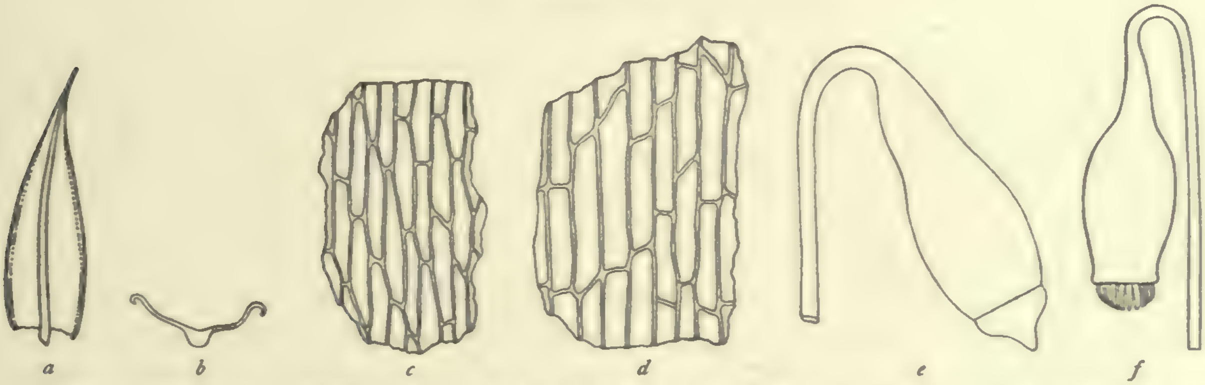
Patagonia australis ad Lapataia in terra paludosa.

BRYUM LAMPROCHÆTE Dusén n. sp.

Pl. IX, Figs. 13–15.

Synoicum; dense intricate cæspitosum, cæspitibus inferne fuscis, superne læte viridibus, sat expansis, humilibus, haud nitidis; *caulis* strictus, erectus, c. 1.5 cm. altus, fere tota longitudine radiculosus, radiculis atropurpureis, fasciculatis, inferne defoliatus, superne, præcipue apice innovando ramulosus, innovationibus c. 3 mm. longis; *folia* inferiora parva, sursum raptim accrescentia, suprema dense conferta, siccitate gemmate conniventia, humida subrecta, usque ad 1.8 mm. longa et 0.5–0.7 mm. lata, stricta, canaliculata, haud decurrentia, late oblongo-lanceolata vel ovato-lanceolata, ob cellulas marginales elongatas, angustissimas, subtriseriatas sublimbata, marginibus reflexis, integerrimis vel apice denticulis paucis, remotis ornatis, carinate nervosa, *nervo* viridi, valido, basi 0.08 mm. crasso, excedente, in foliis supremis cuspidate excurrente; *cellulæ* laxæ, pellucidæ, interdum parce chlorophyllosæ, apicales subelongatæ, interdum subrhombeæ, basales paulum majores, rectangulæ, marginales angustissime elongatae; *bracteæ perichætii* foliis caulinis supremis similes; *seta* tenuis, stricta,

FIG. 16.



Bryum lamprochæte Dusén. *a*, folium, $\frac{18}{1}$; *b*, sectio folii, $\frac{82}{1}$; *c*, cellulæ apicales, $\frac{200}{1}$; *d*, cellulæ basales, $\frac{200}{1}$; *e*, capsula humiditate, $\frac{18}{1}$; *f*, capsula siccitate, $\frac{18}{1}$.

1.5–2.5 cm. alta, rubescenti-nitida; *theca* pendula, brunnea, clavata, collo siccitate rugoso, sporangio breviore; *dentes exostomii* lanceolate subulati, 0.43 mm. alti et 0.1 mm. lati, flavi, apice hyalini, papilloso-scaberuli, ceterum minutissime obscure granulosi, lamellis c. 9 robustis, margines dentium haud attingentibus; *dentes endostomii* hyalini, papillosi, usque ad apicem perforati, dentibus exterioribus paulum breviores; operculum convexe conicum, breviter crasseque apiculatum; cetera ignota.

Hab. Patagonia australis.

Resembling *Bryum validinervium* C. Müll. from Kerguelen Island, but distinct, differing from that species in its shorter stem, longer excurrent nerve, wider and weaker cells of the leaves and more remotely and more robustly lamellated external peristomial teeth.

Resembling also *Bryum macrantherum* C. Müll. from Kerguelen Island, but easily distinguished by the longer excurrent nerve of its leaves and its remotely lamellated external peristomial teeth; the teeth of the species just named have at least 25 lamellæ.

BRYUM VERNICOSUM Dusén n. sp.

Pl. X, Figs. 1, 2.

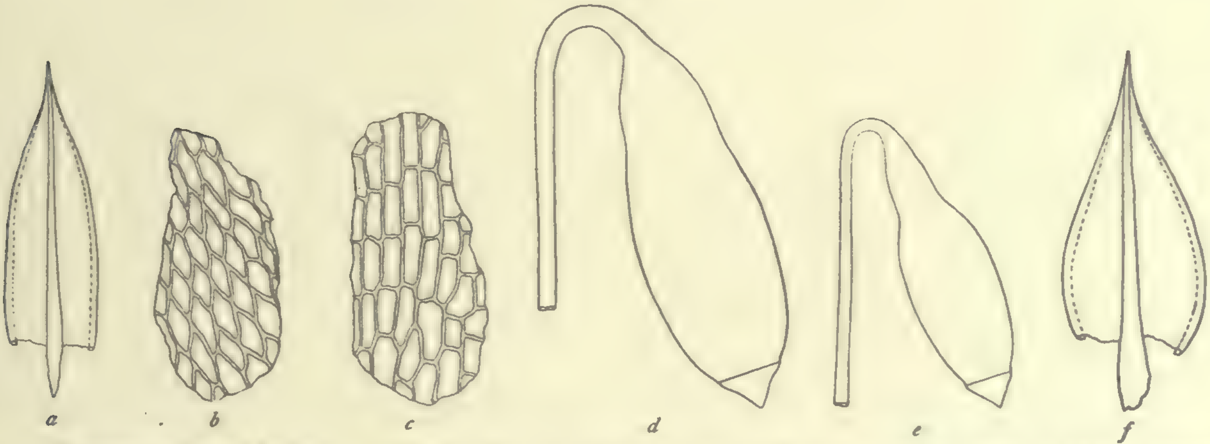
Dioicum; dense intertexte cæspitosum, cæspitibus expansis, humilibus, inferne fuscis, summitate lutescente viridibus, haud nitidis; *caulis* usque ad 1 cm. altus, e basi ad medium vel ultra radiculosus, radiculis atropurpureis, e medio foliosus, simplex vel interdum pauci-ramosus; *folia* infima parva, sursum sensim majora, sicca appressa, humida suberecta, stricta, haud decurrentia, usque ad 1.45 mm. longa et 0.5 mm. lata, concava, marginibus integerrimis, ubique reflexis, carinato-nervosa, *nervo* rubro, valido, basi 0.063 mm. crasso, percurrente, cum apice evanido vel breviter excedente; *cellulæ* laxæ, hyaline, sat firmæ, apicales medianæque plus minusque distincte rhombeæ, basales rectangulæ, marginales longiores, sed cellulis ceteris paulum diversæ; *bracteæ perichætii* foliis caulinis superioribus similes sed paulum majora, nervo longius excedente, sed vix cuspidato, *seta* stricta, tenuis, rubella, nitida, 2–2.5 cm. alta; *theca* pendula, fuscobrunnea, ore atropurpureo-vernicoso, collo sporangio siccitate lato-ovato vel oblongo-ovato breviore, *annulus* secedens, latus, tribus seriebus cellularum compositus; *dentes exostomii* subulati, aurei, 0.35 mm. alti et 0.045–0.050 mm. lati, superne hyalini, lævissimi, inferne minutissime granulosi, lamellis c. 15 prædititi; operculum stricte conicum, atro-

purpureum, vernicosum; *sporæ* 0.021–0.027 mm. magnæ, lævissimæ; cetera ignota.

Hab. Patagonia australis.

Nearly of the same appearance as *Bryum lamprochæte* Dusén, but well distinguished from that species by its stem being simple above, its narrower, more densely and more elegantly lamellated external peristomial teeth which are glabrous above, and by its exactly conical and shining operculum. Besides, the *Bryum vernicosum* is diœcious, the *Bryum lamprochæte* synœcious.

FIG. 17.



Bryum vernicosum Dusén. *a*, folium, $\frac{18}{1}$; *b*, cellulæ apicales, $\frac{200}{1}$; *c*, cellulæ basales, $\frac{200}{1}$; *d*, theca humiditate, $\frac{18}{1}$; *e*, theca siccitate, $\frac{18}{1}$; *f*, folium perigoniale, $\frac{18}{1}$.

Our species seems to be related also to *Bryum minusculum* C. Müll., concluding from the diagnosis, but differs from that species by the absence of innovations, by its always pendulous capsule, the wider cells of its leaves, its much shorter cuspidate leaves, and by its perichætial leaves.

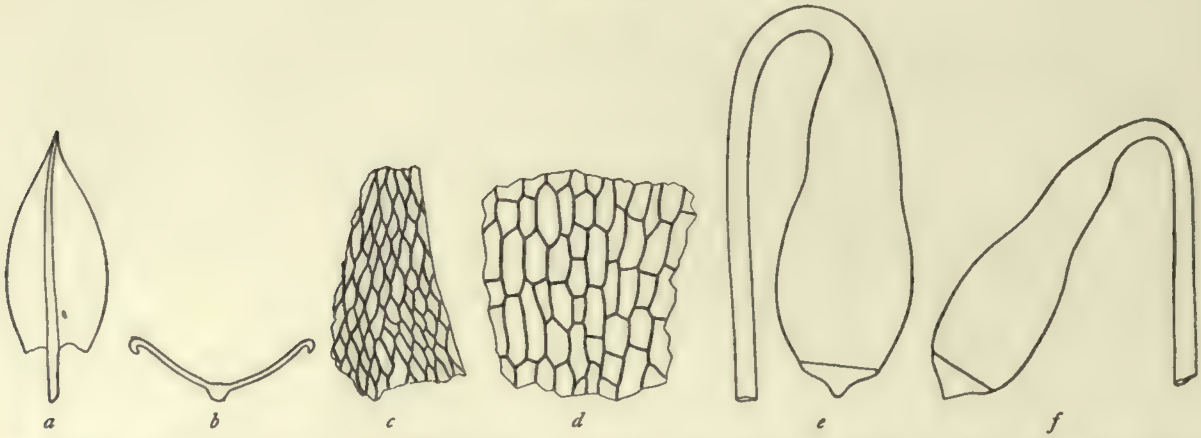
BRYUM RIGOCHÆTE Dusén n. sp.

Pl. X, Figs. 3, 4.

Synoicum; dense cæspitosum, cæspitibus inferne fuscis, superne viridibus, haud nitidis; caulis c. 2 cm. altus, strictus, ad medium atropurpureo-radiculosus, inferne defoliatus, simplex vel fertilitate superne innovando pauci-ramosus; *folia* sicca appressa, humida suberecta, c. 2.7 mm. longa et 1.2 mm. lata, haud decurrentia, ovato-oblonga, leviter incurvata, acuta, apicibus strictis vel paulum reflexis, subcochleariforme concava, marginibus integerrimis reflexisque, carinato-nervosa, *nervo* rubescente, valido,

basi 0.06 mm. crasso, percurrente, cum apice evanescente vel paulum excedente; *cellulæ* pellucidæ, densiusculæ, apicales medianæque rhombeæ vel subhexagonæ, marginales anguste elongatæ, basales ampliores, omnino rectangulæ; *bracteæ perichætii* foliis caulinis similes, sed paulum majores; *seta* erecta, stricta, rigida, fusco-brunnea, subnitida, c. 2 cm. alta; *theca* pendula, brunnea, elongate pyriformis, collo sporangium fere æquante; *dentes exostomii* lanceolate subulati, aurei, superne scabri, ceterum minutissime granulosi, 0.35 mm. alti et basi 0.08 mm. lati, linea divisurali distincta, lamellis c. 16 præditi; *operculum* convexe conicum, breviter apiculato; *sporæ* lævissimæ, 0.027–0.030 mm. magnæ; cetera ignota.

FIG. 18.



Bryum rigochæte Dusén. *a*, folium, $\frac{18}{1}$; *b*, sectio folii, $\frac{82}{1}$; *c*, cellulæ apicales, $\frac{87}{1}$; *d*, cellulæ basales, $\frac{87}{1}$, *e*, capsula humiditate, $\frac{18}{1}$; *f*, capsula siccitate, $\frac{18}{1}$.

Hab. speciei, Patagonia australis, ubi verisimiliter in territorio fontinali fluminis Rio Chico in terra paludosa lecta est.

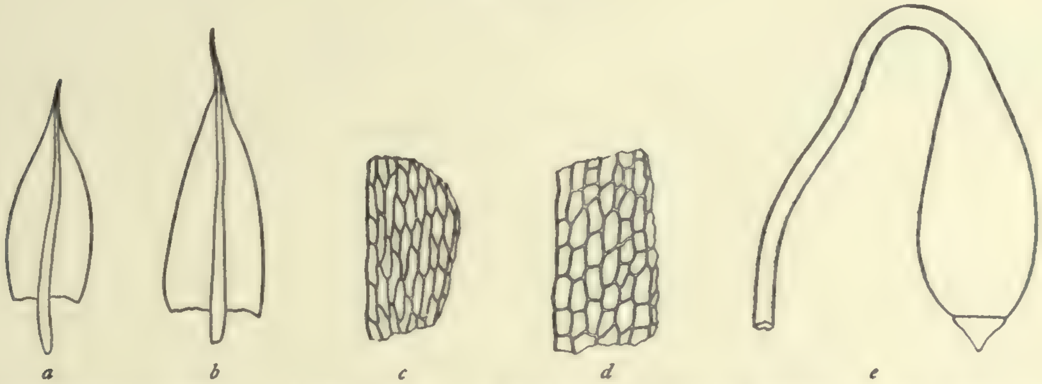
Near to *Bryum lamprochæte* Dusén, but distinct and easily distinguished by its more robust stem, less acute and non-cuspidate leaves and much denser lamellated peristomial teeth. Resembling also *Bryum vernicosum* Dusén, but differing from that species by being more robust, simple or with only flagelliform innovations, ramulose stem, larger and less acute leaves with weaker nerve and much broader peristomial teeth.

BRYUM HATCHERI Dusén n. sp.

Pl. X, Figs. 5, 6.

Dioicum; dense cæspitosum, cæspitibus humilibus, fuscoviridibus, haud nitidis, caulibus inferne leviter intertextis, *caulis* c. 1 cm. altus, erectus vel subascendens, e basi ad medium parce radiculosus, simplex vel basi pauci-ramosus, fertilitate sæpe innovando superne ramulosus, sat tenuis; folia sicca appressa, humida erecta, suprema gemmaceo-conferta, usque ad 2 mm. longa et 0.6 mm. lata, haud decurrentia, ovata-oblonga, cuspidata, concava, elimbata, marginibus integerrimis, haud vel vix reflexis, carinato-nervosa, *nervo* crasso, basi c. 0.08 mm. lato, inferne rubescente, superne viridi, præcipue in foliis supremis longe excedente, summo apice

FIG. 19.



Bryum hatcheri Dusén. *a*, *b*, folia, $\frac{18}{1}$; *c*, cellulæ apicles, $\frac{200}{1}$; *d*, cellulæ basales, $\frac{200}{1}$; *e*, capsula humiditate, $\frac{18}{1}$.

rarissime pauci-denticulato; *cellulæ* laxæ, pellucidæ apicales medianæque subelongatæ, plus minusque distincte hexagonæ basales laxiores, rectangulæ; *bracteæ perichætii* foliis caulinis similes, sed paulum majores et longius cuspidatæ; *seta* erecta, subflexuosa, brunnea nitidiuscula, tenuis, usque ad 1 cm. alta; *theca* pendula, sat parva, oblonge obovata, brunnea, collo turgido, sensim in sporangium transeunte; *annulus* duplex; dentes exostomii humiles, subulati, 0.3 mm. alti et 0.04–0.05 mm. lati, superne hyalini et lævissimi, ceterum flaviduli et minutissime granulosi, fere glabri, remote lamellati, lamellis altis, c. 7; *operculum* stricte conicum; cetera ignota.

Hab. speciei, Patagonia australis, ubi verisimiliter in territorio fontinali fluminis Rio Chico in terra lecta est.

Nearly allied to *Bryum minusculum* C. Müll., to judge from the diagnosis differing in the stronger nerve of its leaves, and their larger size, and by its perichætial leaves, pendulous capsule and conical operculum.

Gen. WEBERA Hedw.

WEBERA CRUDA (L.) Schwaegr.

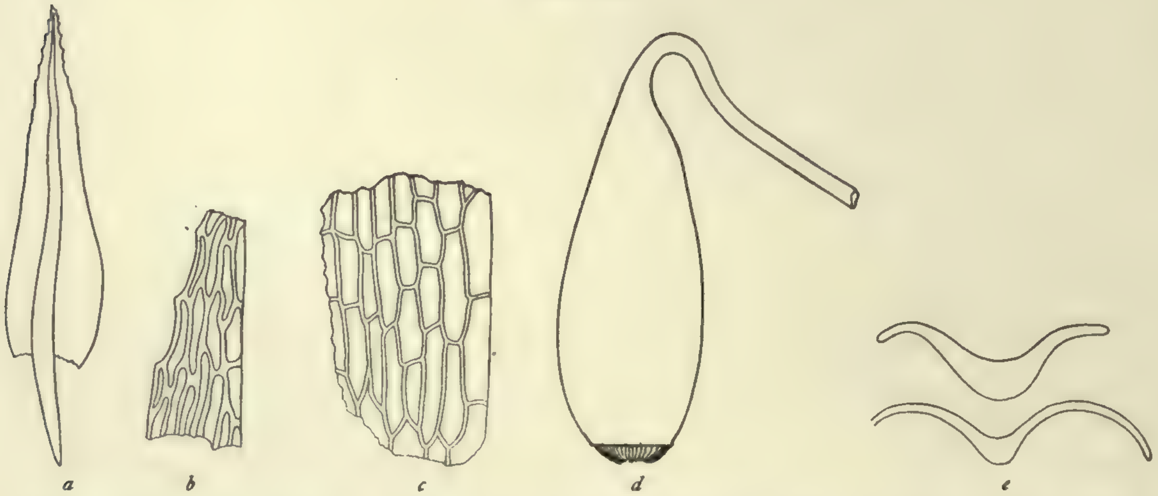
Hab. Patagonia australis in territorio fontinali fluminis Rio Chico ad basin arborum.

WEBERA LONCHOCHÆTE Dusén n. sp.

Pl. X, Figs. 7–9.

Caulis gracillimus, erectus, strictus, simplex vel pauciramosus, inferne defoliatus, e basi fere ad apicem atropurpureo-radiculosus, usque ad 3.5 cm. altus; *folia* sicca subappressa, humida suberecta, stricta, inferiora parva, sursum sensim accrescentia, lutescente viridia, nitida, c. 2 mm. longa et 0.4 mm. lata, paulum decurrentia, e basi subovata lanceolata, acuta, elimbata utroque latere arcuate replicato, marginibus planis, apicem versus serrulatis, ceterum integerrimis, carinato-nervosa, *nervo* valido, basi 0.09 mm. crasso, viridi, subflexuoso, percurrente, sed apicem vix attingente; *cellulæ* firmæ, pellucidæ, lutescente virides, apicales et medianæ elongatæ, basales laxiores, subrectangulæ, ad marginem distincte rectangulæ; *bracteæ perichætii* foliis caulinis similes, sed longius attenuatæ; *seta* tenuis, stricta, erecta, rubescens, nitidula, usque ad 4.5 cm. alta; *theca* pendula, pallide purpurea, ovato-oblonga, collo turgido, in sporangium indistincte transeunte; *dentes exostomii* lanceolati, flavi,

FIG. 20.



Webera lonchochæte Dusén. *a*, folium, $\frac{82}{1}$; *b*, cellulæ apicales, $\frac{200}{1}$; *c*, cellulæ basales, $\frac{200}{1}$; *d*, capsula humiditate, $\frac{18}{1}$; *e*, sectiones folii, $\frac{87}{1}$.

0.44 mm. alti et basi 0.08 mm. lati elimbati, superne hyalini et papilloso-scaberuli, ceterum minutissime granulosi, dense lamellati, lamellis 15–18, subdenticulati; *dentes endostomii* dentibus exostomii æquilongi, hyalini, late perforati, superne nodulosi et papilloso-scaberuli; *cilia* dentibus æquilonga, nodiuscula, scaberula, singula vel interdum bina; *membrana basilaris* 0.2 mm. alta.

Hab. speciei Patagonia australis, ubi in territorio fontinali fluminis Rio Chico in consortio *Aulacomnii palustris* (L.) Schwaegr. occurrit.

Nearly related to *Webera sphagnicola* Schpr., but differing from that species by its elimbate and comparatively remotely lamellated external peristomial teeth and by having fewer cilia; besides the *Webera lonchochæte* is synœcious, the *Webera sphagnicola* diœcious.

Fam. MEESEACEÆ.

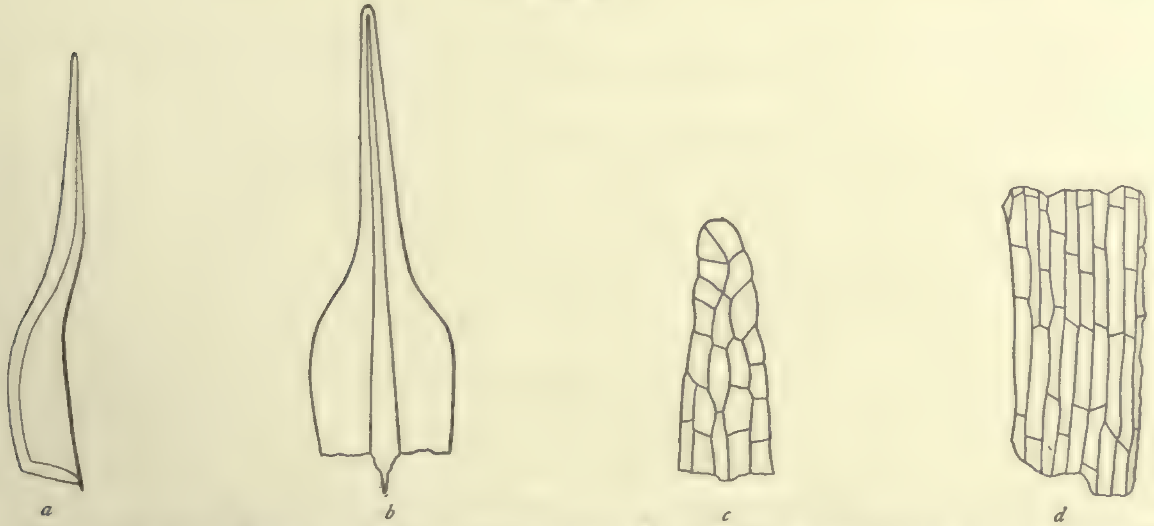
Gen. MEESEA Hedw.

MEESEA PATAGONICA Dusén n. sp.

Pl. XI, Fig. 1.

Dense cæspitosa; *caulis* gracillimus, usque ad 10 cm. longus, simplex, parce radiculosus vel fere eradiculosus, inferne flexuosus, nudus, fuscus, superne strictus, sordide viridis; *folia* 2.5–3.0 mm. longa et basi planefacta 0.8 mm. lata, trifaria, sat distantia, siccitate plus minusque crispata,

FIG. 21.



Meesea patagonica Dusén. *a*, folium a latere visum, $\frac{22}{1}$; *b*, folium deplanatum, $\frac{22}{1}$; *c*, apex folii, $\frac{200}{1}$; *d*, cellulæ basales folii, $\frac{200}{1}$.

humiditate stricta, patentia, c. basi amplexicauli, haud decurrente, lata et brevi raptim contracta, elongate cuspidata, canaliculata, apice rotundata, marginibus integerrimis, erectis, nervo valido, basi 0.18 mm. lato, indistincte limitato, infra summum apicem evanescente; *cellulæ* laxæ, pellucidæ, parietibus teneris, basales rectangulæ, apicales ceteris multo breviores; cetera desunt.

Hab. speciei Patagonia australis, ubi verisimiliter in territorio fontinali fluminis Rio Chico lecta est.

Nearest to *Meesea austro-georgica* C. Müll., differing from that species by its entire leaves, its rectangular leaf-cells and non-excurrent nerve.

The species is one of the most interesting of those brought home from South America by Mr. Hatcher. Hitherto there were only two species of the genus *Meesea* know from the southern part of the globe, viz., *M. austro-georgica* C. Müll. from south Georgia and *M. mulleri* C. Müll. et Hampe from Australia. The *M. patagonica* is then the third species of this genus known from the southern hemisphere.

Fam. Mniaceæ.

Gen. MNIUM Drill.

Mnium rostratum Schrad.

Hab. Patagonia australis in paludosis.

Fam. Rhizogoniaceæ.

Gen. RHIZOGONIUM Brid.

Rhizogonium mnioides (Hook.) Schpr.

Hab. Patagonia australis.

Rhizogonium subbasilare (Hook.) Schpr.

Hab. Patagonia australis.

Fam. Leptostomaceæ.

Gen. LEPTOSTOMUM R. Br.

Leptostomum menziesii (Hook.) R. Br.

Hab. Patagonia australis.

Fam. AULACOMNIACEÆ.

Gen. AULACOMNIUM Schwaegr.

AULACOMNIUM PALUSTRE (L.) Schwaegr.

Hab. speciei Patagonia australis, ubi in territorio fontinali fluminis Rio Chico in consortio *Weberæ lonchochætis* Dusén in paludosis occurrit.

Fam. BARTRAMIACEÆ.

Gen. BARTRAMIA Hedw.

BARTRAMIA MAGELLANICA Aongstr.

Hab. Fuegia australis ad Lapataia.

BARTRAMIA ARISTATA Schpr.

Hab. Fuegia australis ad Villarino.

BARTRAMIA ITYPHYLLA Brid. var. ARENÆ Besch.

Hab. varietatis Patagonia australis, ubi verisimiliter in territorio fontinali fluminis Rio Chico lecta est.

BARTRAMIA PATENS Brid. var. MINOR Dusén.

Humilior densiusque cæspitosa, a typo partium omnium exiguitate differt.

Hab. Patagonia australis.

Gen. BARTRAMIDULA Br. Eur.

BARTRAMIDULA EXIGUA (Sull.) Jaeg.

Hab. Patagonia australis.

Gen. PHILONOTIS Brid.

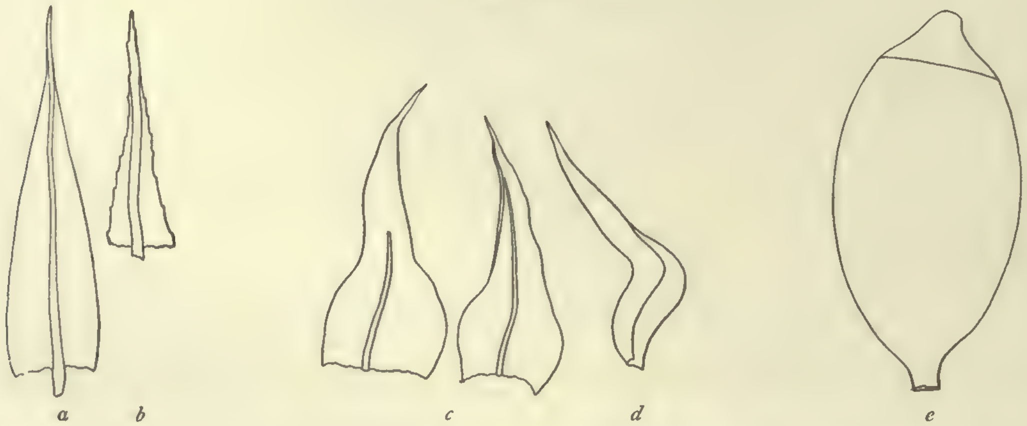
PHILONOTIS VAGANS (Hook. fil. et Wils.) Mitt.

Hab. Patagonia australis in paludosis.

PHILONOTIS PARALLELA Dusén n. sp.

Dioica; dense cæspitosa, cæspitibus superne viridibus vel lutescente-viridibus, inferne fusco-tomentosis, expansis, *caulis* erectus, strictus, omnino c. 3 cm. altus, interdum usque ad 1 dm. altus, ad basin florum innovationes paucas, omnino 1–3 producens, inferne radiculosus, radiculis lævissimis; *folia* inter se conformia, c. 1.4 mm. longa et 0.35–0.40 mm. lata, erecto-patula, heteromalla, lanceolata, subcuspidata, canaliculata, haud plicata, haud decurrentia, marginibus erectis, præcipue apicem versus serrulatis, *nervo* valido, basi 0.063 mm. crasso, subexcurrente, lævissimo; *cellulæ* rectangulæ, dorso leviter papillosæ; *bracteæ perichætii* erectæ, longe attenuatæ, cuspidatæ, cellulis apicalibus angustis, ceterum foliis caulinis similes; *seta* erecta, stricta, c. 2.5 cm. alta, gracilis, rubra, lævissima; capsula erecta, humiditate late ovalis, c. 2.4 mm. longa et 1.35 mm. crassa, siccitate fere cylindrica, subcurvata, 13–16-sulcata, pachydermatica, olivacea, ore rubro; *cellulæ exothecii* omnino rotundate rectangulares, marginales minores, 6–7-seriatæ, illæ striarum parietibus longitudinalibus incrassatis; *dentes exostomii* rubri, 0.4 mm. alti et 0.076 mm. lati, lanceolate subulati, vix dense lamellati, inferne minutissime papillosi, superne papillis crassioribus ornati; *dentes endostomii* dentibus exostomii paulum breviores, papillosi; *cilia* singula vel bina, dentibus endostomii fere æquilonga et paulum angustiora; *operculum* conicum, haud rostratum, apice oblique, truncato.

FIG. 22.



Philonotis parallela Dusén. *a*, folium, $\frac{32}{1}$; *b*, apex folii, $\frac{87}{1}$; *c*, folia perigonialia, $\frac{18}{1}$; *d*, folium perigoniale a latere visum, $\frac{18}{1}$; *e*, capsula humiditate, $\frac{18}{1}$.

Flores masculi disciformes, bracteis e basi erecta genuflexe patentissimis, usque ad 2.3 mm. longis et 1.8 mm. latis, lanceolatis, serrulatis, acutissimis, nervo lato, indistincte limitato, infra apicem evanido, cellulis basalibus aureis, rectangulis, apicalibus, prosenchymaticis.

Hab. Patagonia australis in territorio fontinali fluminis Rio Chico in paludosis.

Resembling *Philonotis fontana* (L.) Brid. but well distinguished from that species by its uniform, lanceolate and not plicate leaves with erect margins, by the absence of incrassations interposed between the upper lamellæ of the external peristomial teeth, etc.

Fam. POLYTRICHACEÆ.

Gen. POLYTRICHADELPHUS C. Müll.

POLYTRICHADELPHUS MAGELLANICUS (Linn. fil.) Mitt.

Hab. Patagonia australis.

Gen. POLYTRICHUM Dill.

POLYTRICHUM JUNIPERINUM Hedw.

Hab. Patagonia australis.

POLYTRICHUM STRICTUM Menz.

Hab. Patagonia australis.

POLYTRICHUM PATAGONICUM C. Müll.

Hab. Patagonia australis.

PLEUROCARPINEÆ.

Fam. LEUCODONTACEÆ.

Gen. LEPYRODON Hampe.

LEPYRODON LAGURUS (Hook.) Mitt.

Hab. Patagonia australis in territorio fontinali fluminis.
Rio Chico in truncis arbustorum arborumque.

LEPYRODON IMPLEXUS (Kze.) Par.

Hab. Fuegia australis ad Lapataia in truncis *Berberidis ilicifoliæ.*

Fam. LESKEACEÆ.

Gen. LESKEA Hedw.

LESKEA FUEGIANA Besch.

Hab. Fuegia.

Fam. Stereodontaceæ.

Gen. CATAGONIUM C. Müll.

Catagonium politum (Hook. fil. et Wils.) C. Müll.

Hab. Patagonia australis.

Gen. ACROCLADIUM Mitt.

Acrocladium auriculatum (Mont.) Mitt.

Hab. Patagonia australis in territorio fontinali fluminis Rio Chico in terra.

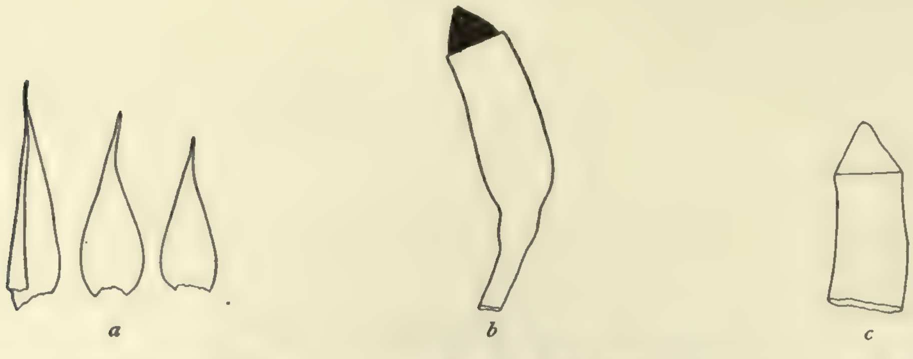
Gen. PLAGIOTHECIUM Br. Eur.

Plagiothecium leptoplumosum Dusén n. sp.

Pl. XI, Figs. 3–5.

Autoicum; dense cæspitosum, cæspitibus humillimis, plus minusque expansis, viridibus vel lutescenti-viridibus, subnitidis, mollibus; *caulis* gracillimus, subascendeus, ad basin ferrugineo-tomentosus, ramos nonnullos, plerumque simplices emittens, usque ad 1.5 cm. longus; *folia* densa, c. 1.1 mm. longa et deplanata 0.4 mm. lata, plerumque subsecunda, e basi semiamplexicauli, haud decurrente ovata vel late lanceolata, canaliculate concava, omnino sat longe cuspidata, marginibus erectis, integerrimis, enervata; *cellulæ* anguste elongatæ, basales ceteris subbreviores, alares vix diversæ; *bracteæ perichætii* erectæ, semiconvolutæ, enervatæ, apice sat raptim contractæ, breviter acutatæ, integerrimæ; *seta* 1.5–2 cm.

Fig. 23.



Plagiothecium leptoplumosum Dusén. *a*, folia, $\frac{32}{1}$; *b*, theca humiditate, $\frac{18}{1}$; *c*, pars superior thecæ operculatæ humiditate, $\frac{18}{1}$.

alta, gracilis, rubra, strictiuscula, superne sinistrorsum, inferne dextrorsum torta, lævissima; theca fere erecta, cylindrica, paulum curvata, pallide brunnea, siccitate sub ore constricta, lævissima, collo distincto; *annulus* simplex; *dentes exostomii* pallide flavi, 0.44 mm. alti et basi 0.06 mm. lati, anguste lanceolati, dense lamellati, inferne medioque transversaliter striati, superne articulati et papillosi; *dentes endostomii* hyalini, dentibus exostomii paulum breviores, subulati, minutissime granulosi, angustissime longitudinaliter perforati; *cilia* 1–3, setacea, nodulosa, minutissime granulosa, dentibus endostomii paulum breviora; *membrana basilaris* c. 0.18 mm. alta; *operculum* conicum, obtusum, haud rostratum.

Flores masc. gemmiformes, ad basin floris fem. dispositi, in tomento occulti.

Hab. speciei Patagonia australis, ubi verisimiliter in territorio fontinali fluminis Rio Chico lecta est.

Completely resembling and closely allied to *Plagiothecium pulchellum* (Dicks.) Br. Eur., but differing from that species by its usually broader and longer cuspidate leaves, more uniform leaf-cells, inner peristomial teeth shorter than the outer, and its simple annulus.

The species also resembles, to judge from the diagnosis, *Plagiothecium fuegianum* (Besch.) differing by its subfalcate and more or less distinctly secund leaves with straight apex, non-papillous perichætial leaves and cylindrical capsule.

Fam. HYPNACEÆ.

Gen. BRACHYTHECIUM Br. Eur.

BRACHYTHECIUM PARADOXUM (Hook. fil. et Wils.) Besch.

Hab. Patagonia australis in territorio fontinali fluminis Rio Chico, ubi in truncis putrescentibus et in terra occurrit.

Gen. SCIAROMIUM Mitt.

SCIAROMIUM CONFLUENS C. Müll.

Hab. speciei Patagonia australis, ubi verisimiliter in territorio fontinali fluminis Rio Chico lecta est.

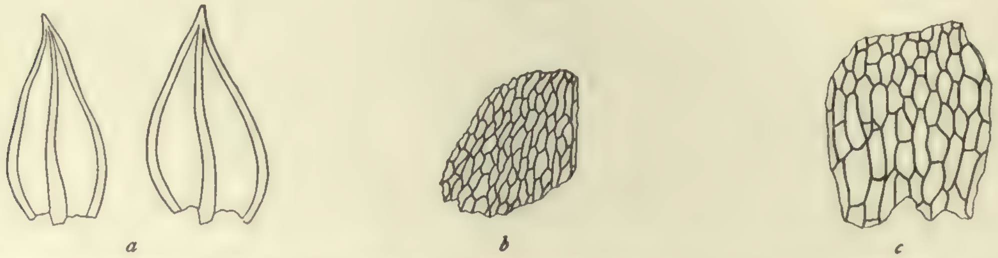
SCIAROMIUM DEPASTUM Dusén n. sp.

Pl. XI, Fig. 2.

Dioicum; densiuscule cæspitosum, cæspitibus expansis, rigidis, superne læte viridibus inferne pallide brunneis; *caulis* strictus, erectus, usque ad

7 cm. altus, inferne costis limbisque persistentibus foliorum vetustorum obtectus, remote ramosus, non rare 2–3 furcatus vel interdum remote fasciculatim ramosus, ramis erectis, simplicibus; *folia* oblonge ovata, subacuta, heteromalla, leviter concava, fere plana, humiditate e basi patentissima leviter incurvata, siccitate magis inflexa, c. 1.25 mm. longa et 0.62 mm. lata, integerrima, carinato-nervosa, nervo valido, basi c. 0.1 mm. crasso, lævissimo, percurrente, crasse limbata, limbo circumducto, ad medium folii c. 0.07 mm. lato; cellulæ parvæ, obscuræ, omnino subrectangulæ.

FIG. 24.



Sciaromium depastum Dusén. *a*, folia, $\frac{18}{1}$; *b*, cellulæ apicales, $\frac{200}{1}$; *c*, cellulæ basales, $\frac{200}{1}$.

Flores fem. in parte superiore caulis dispositi, parvi, gemmiformes, archegoniis sat paucis, paraphysibus paucis, setaceis, flavis, cetera ignota.

Hab. Fuegia australis ad Villarino.

An excellent species, well distinguished from all the other South American species of the same genus by its straight stem, heteromallous and patent, not falcate, and neither subulate nor aristate leaves.

SCIAROMIUM GRACILE Dusén n. sp.

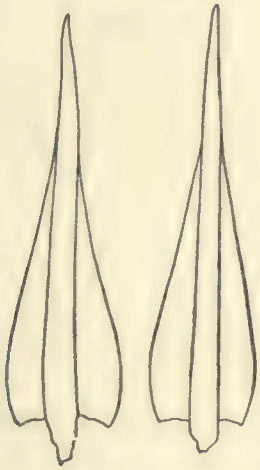
Pl. XI, Fig. 6.

Caulis gracilis, strictus vel strictiusculus, usque ad 5 cm. longus, inferne pallide brunneus, nervis foliorum vetustiorum resistentibus vestitus, superne foliatus viridis, subsimplex vel vage et remote distichaseo-ramosus, ramis simplicibus, tum brevibus, tum sat longis; *folia* patentia, homomalla, c. 1.5 mm. longa et 0.40–0.45 mm. lata, densiuscula, haud decurrentia, e basi ovata sensim attenuata, elongate cuspidata, paulum concava, elimbata, marginibus integerrimis, erectis; *nervo* robusto, viridi, basi 0.12–0.15 mm. lato, paulum supra medium folii excurrente, cuspidem crassiusculam formante; *cellulæ* parvæ, angustæ, subelongatæ, obscuræ, basales ceteris paulum breviores et laxiores; cetera ignota.

Hab. speciei Fuegia australis, ubi ad Lapataia in consortio *Sciaromii depasti* lecta est.

A small and delicate species, very distinct, differing from all the other South American species in its minuteness and in its perfectly elimbated leaves.

FIG. 25.



Sciaromium gracile Dusén. Folia, $\frac{32}{1}$.

Gen. HYPNUM Dill.

HYPNUM UNCINATUM Hedw. subspecies SYMMETRICUM Ren. et Card.

Hab. Patagonia australis.

HYPNUM PERPLICATUM Dusén n. sp.

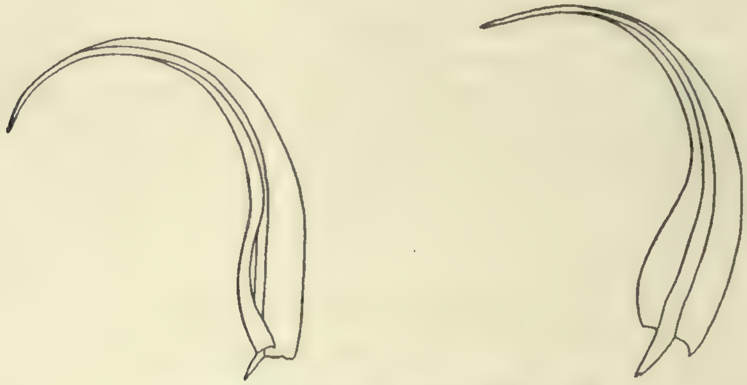
Pl. XI, Fig. 7.

Densiuscule cæspitosum, cæspitibus expansis, superne sordido-viridibus vel flavo-brunneis, inferne sordido-brunneis, rigidiusculis; *caulis* subascendens, plerumque c. 8 cm. interdum usque ad 15 cm. altus, apice falcatus, haud radiculosus, inferne defoliatus, sed nervis persistentibus foliorum vetustorum plus minusque dense obtectus, simplex vel plerumque superne saltem remotiuscule ramosus, ramis distichis et vix ramulosis; *folia* dense conferta usque ad 5.5 mm. longa et basi 0.9 mm. lata, uncinate falcata, e basi sublineari vix decurrente elongate lanceolata, cuspidata, canaliculata, longitudinaliter plicata, marginibus erectis, integerrimis, *nervo* valido, basi 0.25 mm. lata, sat longe excurrente, lævissimo; *cellulæ* anguste elongatæ, lævissimæ, parietibus paulum incrassatis, alares sat paucæ, omnino brevi-

ter rectangulæ, nervum haud attingentes, parietibus paulum sed parum interrupte incrassatis; cetera ignota.

Hab. Patagonia orientalis ad Cape Fairweather in paludosis.

FIG. 26.



Hypnum perplicatum Dusén. Folia, $\frac{18}{1}$.

Near to *Hypnum falcatum* Brid., but very distinct, differing from that species by its longer, quite glabrous and scarcely decurrent leaves with doubly broader and excurrent nerve, and by the absence of paraphylla.

STOCKHOLM, January 1, 1901.

(We desire to explain that for the method here followed, as elsewhere in these Reports, of printing all specific names with small initial letter, the respected author of this part is not responsible.—EDITOR.)

ERRATA AND EMENDATIONS IN PART III.

Page 67, line 11, for Lindl. read Lindb.

Page 67, line 17, for radiculosis read radiculosus.

Page 67, line 2 from foot, for vel papillosæ read lævissimæ.

Page 70, line 7 from foot, for shorter read longer and more robust; line 5 from foot add n. sp.

Page 71, line 2 from foot, for secto folio read sectio folii.

Page 72, lines 15, 14 from foot, delete all after the word "ones."

Page 73, fig. 5, cut *d* should be erect.

Page 74, line 10, for vel nitidis read nitidiusculis.

Page 74, line 11, for 2–3 read 2–4.

Page 74, line 13 from foot, after flavidula insert annulus triplex.

Page 74, lines 10, 9 from foot for subnodulari read subnodulosi.

Page 74, line 9 from foot, delete plicato-.

Page 75, line 5 from foot, for densiuscula read densiuscule.

Page 76, line 9, for incrassatis read subincrassatis.

Page 76, fig. 6, the cut *d* should be inverted.

Page 77, line 2, after dilatata add subclavata.

Page 77, line 6, for *conotricha* (Müll) read *anderssonii* Card.

Page 77, line 9, add *B. perrubiginosa* is evidently a weak species.

Page 78, line 2, after incrassatis add et in cellulis infraapicalibus; after subflexuosis add supernæ nonnullæ plus minusque elongatæ; and for saltem read rare.

Page 79, fig. 8, *g* refers to the upper figure; and in the explanation of *g*, for humiditate read siccitate.

Page 80, fig. 9, cut *a* should be turned 90°; similarly page 83, fig. 11, cut *g*.

Page 80, line 1, omit speciei; similarly passim.

Page 82, line 9 from foot, for subuncinati read subuncinata.

Page 82, line 3 from foot, for 0.135 read 0.013.

Page 84, line 10 from foot, for incrassa- read incrassation.

Page 86, line 4, for and read ad.

Page 88, line 4, for MUSCULA read MASCULA.

Page 90, line 7 from foot, for majora read majores.

Page 94, line 7, before *Caulis* prefix *Synoica.*

Page 96, line 1 for c. basi read e basi.

Page 102, line 6 from foot, for homomalla read heteromalla.

Page 104, line 1, for parum read vix.

Page 104, line 5, for glabrous read entire.

(N. B. It should be observed that it was impracticable for the author to revise the proofs.—Ed.)

CATALOGUE OF

MUSCI OF PATAGONIA AND FUEGIA.

(INCLUDING DESCRIBED SPECIES AND OTHERS
NOT YET DESCRIBED.)

BY

PER DUSÉN.

MUSCI FROM THE FALKLAND ISLANDS, FUEGIA, AND PATAGONIA.

A. DESCRIBED SPECIES.

MUSCI.

SPHAGNALES.

Fam. SPHAGNACEÆ.

Gen. SPHAGNUM Dill.

Sphagnum cuspidatum Ehrh., var. *falcatulum* (Besch.) Par., Staaten I.; Cape Horn; Patagon. occ..

S. cuspidatum var. *microcarpum* (Warnst.) Par., Falkland Is.

S. cymbifolium Ehrh., var. *condensatum* Hook. f. & Wils., Fretum Magellanicum.

S. fimbriatum Wils., Falkland Is.; Hermite I.; Fretum Magellanicum.

S. fimbriatum var. *robustum* Braithw., Fuegia; Patagon. austr.

S. medium Limpr., var. *fusco-rubellum* Warnst., forma *brachydasyclada* Warnst.

S. medium var. *pallido-carneum* Warnst., form. *brachyorthoclada* Warnst.

ANDREÆALES.

Fam. ANDREÆACEÆ.

Gen. ACROSCHISMA Hook. f. & Wils.

Acroschisma wilsoni Hook. f., Hermite I.; Fuegia; Patagon. occ.

Gen. ANDREÆA Ehrh.

Andreæa acutifolia Hook. f. & Wils., Hermite I.; Cape Horn.
A. appendiculata Sch., Cape Horn; Fuegia.
A. laxifolia Hook. f. & Wils., Hermite I.; Cape Horn.
A. marginata Hook. f. & Wils., Hermite I.; Fuegia.
A. mutabilis Hook. f. & Wils., Falkland Is.
A. petrophila Ehrh., Fuegia.
A. pseudo-alpina C. Müll., Fuegia.
A. subulata Harv. var. *perichætialis* Harv., Falkland Is.; Hermite I.
A. subulata var. *rigida* Harv. & C. Müll., Hermite I.; Fuegia.

BRYALES.

ACROCARPINEÆ.

Fam. DICRANACEÆ.

Subfam. *DICRANELLEÆ.*

Gen. ANISOTHECIUM Mitt.

Anisothecium perpusillum Dusén.
A. patagonicum C. Müll., Patagon. austr.

Subfam. *DICRANEÆ.*

Gen. DICRANOWEISIA Lindb.

Dicranoweisia antarctica (C. Müll.) Par., Hermite I.; Fuegia.
D. austro-crispula (C. Müll.) Par., Staaten I.; Fuegia; Patagon. occ.
D. perpulvinata Dusén, W. Patagon.

Gen. ONCOPHORUS Brid.

Oncophorus fuegianus Card., Fuegia austr.

Gen. DICRANUM Hedw.

Dicranum aciphyllum Hook. f. & Wils., Falkland I.; Staaten I.; Fret. Mag. occ.; Patagon. occ.

D. australe Besch., Staaten I.; Fuegia; Fret. Mag.; Patagon. occ.

D. billardieri Schwaegr., Falkland Is.; Fuegia; Fret. Mag. occ.; Patagon. occ.

D. cirrhifolia Sch. in litt., Fuegia; Patag. austr. et occ.

D. dicranellatum Dusén, Fuegia; Patagon. occ.

D. harioti C. Müll., Fuegia; Hoste I.

D. imponens Mont., Staaten I.; Hermite I.; Cape Horn; Fuegia; Patagon. occ.

D. lati-costatum Card., Fuegia austr.; Fret. Mag.

D. leucopterum C. Müll., Staaten I.; Fuegia.

D. nigricaule Aongstr., Fuegia; Patagon. austr. et occ.

D. pumilum Mitt., Hermite I.; Fuegia.

D. racovitzæ Card., Fretum Magellan.

D. ramulosum Mitt., Hermite I.; Fuegia.

D. rigens Besch., Patagon. occ.

D. robustum Hook. f. & Wils., Hermite I.; Cape Horn; Fuegia; Fret. Mag.; Patagon. occ. — var. *pungens* Hook. f. & Wils. cum typo.

D. setosum Hook. f. & Wils, Fret. Mag.

D. tonini C. Müll., Patagon. austr.

Gen. CAMPYLOPUS Brid.

Campylopus acuminatus Mitt., Hermite I.; Fuegia.

C. crassissimus Besch., Patagon. occ.

C. flavissimus (C. Müll.) Par., Fuegia.

C. introflexus (Hedw.) Mitt., Patagon. occ.

C. laniger Besch., Hermite I., Fuegia; Patagon. occ.

C. morenoi C. Müll., Patagon. austral.

C. orthocomus Besch., Fuegia.

C. perincanus (C. Müll.) Par., Staaten I.

C. saddleanus Besch., Fuegia.

C. spegazzinii (C. Müll.) Par., Staaten I.

Subfam. *RHABDOWEISIEÆ.*

Gen. DICHODONTIUM Sch.

Dichodontium paludella Besch., Fuegia; Fret. Mag.
D. jamesoni (Taylor) Sch., Hermite I.

Subfam. *SELIGERIEÆ.*

Gen. BLINDIA Br. Eur.

Blindia arcuata Mitt., Hermite I.
B. auriculata C. Müll., Staaten I.; Fuegia.
B. churuccana Besch., Fret. Mag. occ.
B. contecta (Hook. f. & Wils.) C. Müll., Fret. Mag.; Patagon. occ.
B. curviseta Mitt., Falkland I.; Staaten I.; Hermite I.; Fuegia.
B. humilis C. Müll., Staaten I.
B. leptotrichocarpa C. Müll., Staaten I.
B. leptotrichocarpa var. *strictiuscula* C. Müll., Staaten I.
B. lygodipoda C. Müll., Staaten I.; Fuegia.
B. magellanica Sch., Hermite I.
B. savatieriana C. Müll., Fret. Mag. occ.
B. tenuifolia (Hook. f. & Wils.) Mitt., Hermite I.; Fuegia.

Subfam. *DITRICHEÆ.*

Gen. DITRICHUM Timm.

Ditrichum affine (C. Müll.) Hpe., Patagon. occ.
D. conicum (Mont.) Par., Patagon. occ.
D. hookeri (C. Müll.) Hpe., Hermite I.; Fuegia; Fret. Mag. occ.
D. hyalinum (Mitt.) Par., Falkland Is.; Hermite I.; Cape Horn; Fuegia.
D. longisetum Lor., Fret. Mag. occ.; Patagon. austr.
D. præaltum (Mitt.) Par., Patagon. austr. et occ.
D. strictum (Hook. f. & Wils.), Falkland Is.; Hermite I.; Cape Horn; Fuegia.

Gen. DISTICHIUM Br. Eur.

Distichium capillaceum (L.) Br. Eur., Hermite I.; Cape Horn; Fuegia; Patagon. austr. et occ.

Gen. CERATODON Brid.

Ceratodon purpureus (L.) Brid., var. *amblyocalyx* C. Müll., Fuegia; Patagon.

Fam. POTTIACEÆ.

Subfam. *POTTIEÆ.*

Gen. POTTIA Ehrh.

Pottia antarctica Aongstr., Fuegia; Patagon. austr.
P. megapoda C. Müll., Patagon. austr.
P. spegazzinii C. Müll., Staaten I.; Patagon. austr.

Gen. BARBULA Hedw.

Barbula antarctica Hpe., Falkland Is.
B. arenæ Besch., Fret. Mag.
B. andersonii (Aongstr.), Fuegia; Patagon. austr. et occ.
B. chrysopila C. Müll., Fuegia; Fret. Mag.
B. conotricha C. Müll., Fuegia; Patagon. austr.
B. conotricha C. Müll. var. *fagicola* C. Müll., Patagon.
B. crispatula (C. Müll.), Patagon. occ.
B. densifolia Hook. f. & Wils., Falkland Is.
B. flagellaris Sch., Fret. Mag.; Patagon. occ.
B. fuegiana (Mitt.) Jaeg., Falkland Is.; Fuegia; Patagon. austr.
B. lechleri C. Müll., Fret. Mag.
B. patagonica (Mitt.) Jaeg., Patagon.
B. perrubiginosa Dusén., Patagon. occ.
B. pusilla (Aongstr.) C. Müll., Fuegia; Fret. Mag.
B. robusta (Hook. & Grev.) Brid., Falkland Is.; Fuegia; Patagon. austr. et occ.

Fam. GRIMMIACEÆ.

Gen. GRIMMIA Ehrh.

Grimmia amblyophylla C. Müll., Hermite I.; Fret. Mag.
G. apocarpa (L.) Hedw., Hermite I.; Fret. Mag.
G. austro-leucophæa Besch., Fuegia.
G. depressa C. Müll., Staaten I.; Fuegia.
G. depressa C. Müll., var. *terrestris* C. Müll., Patagon. austr.
G. fallax Dusén, Patagon. austr.
G. humilis Mitt., Patagon. austr.

G. macropulvinata Dusén, Patagon. austr.
G. tortuosa Hook. f. & Wils., Falkland Is.

Gen. RHACOMITRIUM Brid.

Rhacomitrium heterostichum (Hedw.) Brid., Falkland Is.
R. lævigatum (Mitt.) Jaeg., Hermite I.; Fuegia; Patagon. occ.
R. lanuginosum (Hedw.) Brid., Falkland Is.; Hermite I.; Fuegia; Patagon. occ.
R. nigritum (C. Müll.) Jaeg., Hermite I.; Fuegia; Fret. Mag.; Patagon. occ.
R. protensum A. Br., Fuegia.
R. rupestre Hook. f. & Wils., Hermite I.; Fuegia.
R. sublamprocarpum (C. Müll.) Par., Fuegia.
R. subnigritum (C. Müll.) Par., Fuegia.
R. symphyodontum (C. Müll.) Par., Falkland Is.; Hermite I.; Fuegia; Patag. occ.

Gen. SCOULERIA Hook.

Scouleria patagonica (Mitt.) Jaeg., Patagon. occ.

Gen. PTYCHOMITRIUM Br. Eur.

Ptychomitrium ligulatum (Mitt.) Jaeg., Hermite I.; Fuegia.

Fam. ORTHOTRICHACEÆ.

Gen. ORTHOTRICHUM Hedw.

Orthotrichum compactum Dusén, Patagon. austr.
O. crassifolium Hook. f. & Wils., Falkland Is.; Staaten I.; Hermite I.; Fuegia.
O. elegantulum Sch., Fret. Mag.
O. macloskii Dusén, Patagon. austr.

Gen. ULOTA Brid.

Ulota crenato-erosa (C. Müll.) Par., Fuegia.
U. darwinii Mitt., Fuegia.
U. eremitensis Mitt., Hermite I.; Cape Horn; Fuegia.
U. fuegiana Mitt., Staaten I.; Hermite I.; Cape Horn; Fuegia.
U. fulvella Mitt., Fuegia; Patagon. occ.

U. glabella Mitt., Hermite I.
U. gymnomitria C. Müll., Patagon.
U. hamata Dusén, Patagon.
U. incana (C. Müll.) Par., Fuegia austr.; Fret. Mag.
U. inclinata (C. Müll.) Par., Fuegia.
U. leiothecia (C. Müll.) Jaeg., Fret. Mag.
U. lobbiana Mitt., Patagon.
U. macro-calycina (Mont.) Jaeg., Fret. Mag.
U. magellanica (Mont.) Jaeg., Fret. Mag.
U. phyllantha Brid., Hermite I.; Fuegia; Fret. Mag.
U. pygmiothecium (C. Müll.) Par., Fuegia.
U. savatieri Besch., Patagon. occ.

Gen. MACROMITRIUM Brid.

M. harioti Besch., Fuegia austral.
M. bifasciculare C. Müll. in herb., Fuegia austral.; Patagon. occ.
M. hymenostomum Mont., Cape Horn; Fuegia.
M. krausei Lor., Patagon. occ.
M. saddleanum Besch., Fuegia.
M. tenax C. Müll., Fret. Mag.; Patagon. occ.

Gen. SCHLOTHEIMIA Brid.

Schlotheimia gracillima Besch., Fuegia.

Gen. AMPHIDIUM Nees.

Amphidium cyathicarpum (Mont.), Patagon. occ.

Gen. ZYGODON Hook. &. Tayl.

Zygodon curvicaulis Dusén, Patagon. occ.
Z. hyadesii Besch., Fuegia; Patagon. occ.
Z. hatcheri Dusén, Patagon. occ.

Gen. PENTASTICHELLA C. Müll.

Pentastichella pentasticha (Mont.) C. Müll., Patagon. occ.

Fam. Eustichiaceæ.

Gen. EUSTICHIA C. Müll.

Eustichia longirostris (Brid.) C. Müll., Fret. Mag.; Patagon. occ.

Fam. SPLACHNACEÆ.

Gen. DISSODON Grev. & Arn.

Dissodon magellanicus Hpe., Fuegia; Fret. Mag.; Patagon. occ.

Gen. TETRAPLODON Br. Eur.

Tetraplodon fuegianus Besch., Fuegia; Patagon. austr.

Gen. HYMENOCLEISTON Duby.

Hymenocleiston magellanicum Duby., Fuegia; Patagon. occ.
Hymenocleiston magellanicum var. *edenense*, Besch., Patagon. occ.

Fam. FUNARIACEÆ.

Gen. FUNARIA Schreb.

Funaria hygrometrica (L.) Hedw., var. *fuegiana* C. Müll., Fuegia; Patagon. austr.

Fam. BRYACEÆ.

Gen. MIELICHOFERIA Hornsch.

Mielichoferia spegazziniana C. Müll., Staaten I.

Gen. ORTHODONTIUM Schwaeger.

Orthodontium australe Hook. f. & Wils., Falkland Is.; Hermite I.; Fuegia.

Gen. BRACHYMENIUM Hook.

Brachymenium magellanicum (Sull.), Par., Fuegia.

Gen. LEPTOBRYUM Sch.

Leptobryum pyriforme (L.) Sch., Fuegia; Patagon. occ.
L. pottiaceum Dusén, Fuegia; Patagon. occ.

Gen. BRYUM Dill.

Bryum arenæ C. Müll., Fret. Mag.
B. bimum Schreb., Fuegia; Patagon. austr.
B. gemmatum C. Müll., Fuegia.

B. hatcheri Dusén, Patagon. austr.

B. lævigatum Hook. f. & Wils., Falkland Is., Hermite I.; Fuegia.

B. lamprochæte Dusén, Patagon. austr.

B. lonchochæte Dusén, Patagon. austr.

B. minusculum C. Müll., Fuegia.

B. rigochæte Dusén, Patagon. austr.

B. spegazzinii C. Müll., Fuegia.

B. vernicosum Dusén, Patagon. austr.

Gen. WEBERA Hedw.

Weber albicans (Wahlb.) Sch., Falkland Is.; Fuegia.

W. alticaulis (C. Müll.) Par., Fuegia; Patagon. occ.

W. cruda (L.) Schwaegr., Fuegia; Patagon. austr. et occ. (Syn. *W. synoico-cruda* C. Müll.)

W. nutans (Schreb.) Hedw., Falkland Is.; Hermite I.; Cape Horn; Fuegia.

W. sphagnadelphus (C. Müll.) Besch., Fuegia; Patagon. austr.

W. philonotea (C. Müll.) Par., Fuegia.

Fam. MNIACEÆ.

Gen. MNIUM Dill.

Mnium leptolimbatum C. Müll., Patagon. austr.

M. rostratum Br. & Schimp., Falkland Is.; Fuegia; Patagon. austr. et occ.

Fam. RHIZOGONIACEÆ.

Gen. RHIZOGONIUM Brid.

Rhizogonium mnioides (Hook.) Sch., Hermite I.; Fuegia; Patagon. occ.

R. reticulatum (Hook. f. & Wils.) Mitt., Hermite I.; Fuegia; Patagon. austr.

R. subbasilare (Hook.) Sch., Hermite I.; Fuegia; Patagon. occ.

Fam. LEPTOSTOMACEÆ.

Gen. LEPTOSTOMUM R. Br.

Leptostomum menziesii (Hook.) R. Br., Fuegia; Patagon. austr. et occ.

Gen. LEPTOTHECA Schwaegr.

Leptotheca gaudichaudii Schwaegr., Falkland Is.
L. spegazzinii C. Müll., Fuegia; Patagon. occ.

Fam. Aulacomniaceæ.

Gen. AULACOMNIUM Schwaegr.

Aulacomnium palustre (L.) Schwaegr., Patagon. austr.

Fam. Bartramiaceæ.

Gen. BARTRAMIA Hedw.

Bartramia aristata Sch., Fuegia austr.
B. magellanica Aongstr., Fuegia; Patagon. austr. et occ.
B. patens Brid., Falkland Is.; Staaten I.; Fuegia; Patagon. occ.
B. pomiformis (L.) Hedw., Fuegia; Fret. Mag.
B. ityphylla var. *arenæ* Besch., Patagon. austr.

Gen. BARTRAMIDULA Br. Eur.

Bartramidula exigua (Sull.) Jaeg., Fuegia; Patagon. austr. et occ.

Gen. CONOSTOMUM Sw.

Conostomum australe Sw., Falkland Is.; Hermite I.; Fuegia.
C. magellanicum Sull., Fuegia.

Gen. BREUTELIA Sch.

Breutelia aureola Besch., Patagon. occ.
B. brachycoma Besch., Patagon. occ.
B. dumosa Mitt., Hermite I.; Fuegia; Patagon. occ.
B. elongata Hook. f. & Wils., Fret. Mag. occ.; Patagon. occ.
B. hariotiana Besch., Hermite I.; Fuegia; Patagon. occ.
B. pendula (Hook.) Jaeg., Hermite I.; Fuegia.
B. plicata Mitt., Fret. Mag. occ.; Patagon. occ.
B. robusta (Hook. f. & Wils.) Jaeg., Fuegia.
B. rupestris (Mitt.) Jaeg., Hermite I.; Fuegia.

Gen. PHILONOTIS Brid.

Philonotis nigroflava C. Müll., Patagon. austr.

P. parallela Dusén, Patagon. austr. et occ.

P. vagans (Hook. f. & Wils.) Mitt., Fuegia; Patagon. occ.

Fam. Polytrichaceæ.

Gen. POLYTRICHADELPHUS C. Müll.

Polytrichadelphus dendroides (Hedw.) Mitt., Hermite I.; Fuegia; Patagon. occ.

P. magellanicus (L.) Mitt., Falkland I.; Fuegia; Patagon. austr. et occ.

P. squamosa (Hook. f. & Wils.) Mitt., Hermite I.; Falkland Is.; Fuegia.

Gen. POLYTRICHUM Dill.

Polytrichum elongatum P. B., Fret. Mag.

P. juniperinum Hedw., Hermite I.; Cape Horn; Falkland Is.; Fuegia; Patagon.

P. patagonicum C. Müll., Fuegia; Patagon.

P. piliferum Schreb., Falkland Is.; Cape Horn; Fuegia; Patagon.

P. strictum Banks, Fuegia; Patagon.

P. trachynotum C. Müll., Fuegia.

P. spegazzinii C. Müll., Fuegia austr.

Gen. PSILOPILUM Brid.

Psilopilum compressum (Hook. f. & Wils.) Mitt., Hermite I.; Fuegia.

PLEUROCARPINEÆ.

Fam. Rhacocarpaceæ.

Gen. RHACOCARPUS Lindl.

Rhacocarpus humboldti (Spreng.) Lindb., Falkland Is.; Hermite I.; Fuegia; Fret. Mag. occ.; Patagon. occ.

Fam. Cryphæaceæ.

Gen. CRYPHÆA Brid.

Cryphæa consimilis Mont., Patagon. occ.

C. tenella Mitt., Patagon. occ., Lago Nahuel-huapi.

Gen. DENDROCRYPHÆA Par. & Sch.

Dendrocryphæa gorveana (Mont.) Par., Patagon. occ.

Fam. Leptodontaceæ.

Gen. LEPTODON Mohr.

Leptodon smithii (Dicks.) Mohr., Patagon. occ., Lago Nahuel-huapi.

Fam. Leucodontaceæ.

Gen. LEPYRODON Hpe.

Lepyrodon implexus (Kze.) Par., Fuegia; Patagon. austr. et occ.
L. lagurus (Hook.) Mitt., Fuegia; Patagon. austr. et occ.

Fam. Neckeraceæ.

Gen. PILOTRICHELLA C. Müll.

Pilotrichella cumingii (C. Müll.) Lor., Patagon. occ.
P. krausei Lor., Patagon. occ.

Gen. NECKERA Hedw.

Neckera chilensis Mitt., Patagon. occ.
N. scabridens C. Müll., Patagon. occ.

Gen. THAMNIUM Br. Eur.

Thamnium arbusculans C. Müll. in herb., Fuegia; Patagon. occ.
T. decumbens Besch., Fret. Mag.

Fam. Hookeriaceæ.

Gen. MNIADELPHUS C. Müll.

Mniadelphus flaccidus (Hook. f. & Wils.) Hpe., Hermite I.; Fuegia.
M. krausei Lor., Fuegia; Fret. Mag. occ.; Patagon. occ.

Gen. CYATHOPHORUM P. Beauv.

Cyathophorum splendidissimum (Mont.) Hpe. & Lor., Patagon. occ.

Gen. ERIOPUS Brid.

Eriopus apiculatus (Hook. f. & Wils.) Mitt., Hermite I.; Fuegia.

Gen. HOOKERIA Sm.

Hookeria ancistroides Mont., Patagon. occ.

Gen. DISTICHOPHYLLUM Dz. & Mitt.

Distichophyllum dicksoni (Hook.) Mitt., Falkland Is.; Hermite I.; Fuegia.

D. eremitæ (C. Müll.) Jaeg., Hermite I.; Fuegia.

D. molle Besch., Fuegia.

D. nigricans Besch., Fuegia.

D. patagonicum Besch., Patagon. occ.

Gen. PTERYGOPHYLLUM Brid.

Pterygophyllum anomalum (Schwaegr.) Mitt., Hermite I.

P. denticulatum (Hook. f. & Wils.) Mitt., Falkland Is.; Hermite I.

P. magellanicum Besch., Fret. Mag. occ.; Patagon. occ.

P. obscurum (Mont.) Mitt., Fuegia; Patagon. occ.

Fam. LESKEACEÆ.

Gen. LESKEA Hedw.

Leskea fuegiana Besch., Fuegia; Patagon. austr. et occ.

Fam. STEREODONTACEÆ.

Gen. ACROCLADIUM Mitt.

Acrocladium auriculatum Mitt., Fuegia; Patagon. austr. et occ.

A. chlamydophyllum (Hook. f. & Wils.), Fuegia; Patagon. austr. et occ.

A. (?) *morenoi* C. Müll., Patagon. occ.

Gen. CATAGONIUM C. Müll.

Catagonium politum (Hook. f. & Wils.) C. Müll., Hermite I.; Fuegia; Patagon. austr. et occ.

Gen. PLAGIOTHECIUM Br. Eur.

Plagiothecium leptoplumosum Dusén, Fuegia; Patagon. occ.

P. lucidulum (Hook. f. & Wils.) Mitt., Falkland Is.; Hermite I.; Fuegia.

P. magellanicum (C. Müll.), Fuegia austr.

Gen. STEREODON (Brid.) Mitt.

Stereodon lechleri (C. Müll.), Patagon. occ.
S. nitidus (Hook. f. & Wils.), Staaten I.; Hermite I.; Fuegia.

Gen. PTYCHOMNIUM Mitt.

Ptychomnium aciculare (Brid.) Mitt., Fuegia; Patagon. occ.
P. cygnisetum (C. Müll.) Par., Fuegia; Patagon. occ.
P. ptychocarpon (Schwaegr.) Mitt., Patagon. occ.
P. subaciculare Besch., Patagon. occ.

Gen. CLADOMNIUM Hook. f. & Wils.

Cladomnium gracile (Hpe.) Mitt., Patagon. occ.

Fam. Sematophyllaceæ.

Gen. RHAPHIDOSTEGIUM Br. Eur.

Rhaphidostegium amœnum (Hedw.) Par., Hermite I.; Fuegia.
R. callidum (Mont.) Jaeg., Patagon. occ.
R. leucocyton (C. Müll.) Jaeg., Hermite I.
R. noduliferum (Mitt.) Jaeg., Hermite I.; Fuegia.
R. pallens (Sch.), Fuegia; Patagon. occ.
R. secundifolium (C. Müll.) Jaeg., Hermite I.; Fuegia.

Fam. Hypnaceæ.

Gen. BRACHYTHECIUM Br. Eur.

Brachythecium longidens (C. Müll.) Par., Fuegia.
B. morenoi C. Müll., Patagon. austr.
B. paradoxum (Hook. f. & Wils.) Besch., Hermite I.; Fuegia; Patagon. austr. et occ.
B. sericeo-virens (C. Müll.) Par., Fuegia.
B. spegazzinii (C. Müll.) Par., Fret. Mag.
B. spurio-albicans C. Müll., Patagon. austr.
B. subpilosum (Hook. f. & Wils.) Par., Falkland Is.

Gen. ERIODON Mont.

Eriodon conostomus Mont., Patagon. occ.

Gen. RIGODIUM Kze.

Rigodium nano-fasciculatum C. Müll., Patagon. occ.
R. tamarix C. Müll., Fuegia.
R. toxarion (Schwaegr.) Sch., Patagon. occ.

Gen. SCIAROMIUM Mitt.

Sciaromium confluens (C. Müll.) Par., Patagon. austr. et occ.
S. depastum Dusén, Fuegia austr.

Gen. STEREOPHYLLUM Mitt.

Stereophyllum fuegianum Besch., Hermite I.; Fuegia.

Gen. AMBLYSTEGIUM.

Amblystegium uncinatum De Not.; var. *symmetricum* (Ren. et Card.), Fueg.; Patagon. occ.

Gen. HYPNUM Dill.

Hypnum austro-uncinatum C. Müll., Patagon. occ.
H. fluitans L. var. *laculosa* (C. Müll.) Par., Staaten I
H. fuegianum (Mitt.) C. Müll., Hermite I.; Fuegia.
H. longifolium (Mitt.) Jaeg., Falkland Is.
H. uncinatum Hedw., Fuegia; Patagon. occ.
H. perplicatum Dusén, Fret. Mag.

Gen. HYPNODENDRON C. Müll.

Hypnodendron krausei (C. Müll.) Jaeg., Patagon. occ.

Fam. Hypopterygiaceæ.

Gen. HYPOPTERYGIUM Brid.

Hypopterygium didictyon C. Müll., Hermite I.; Fuegia; Patagon. occ.
H. flexisetum Hpe., Patagon. occ.
H. thouinii Mont., Fuegia; Patagon. occ.

B. UNDESCRIBED SPECIES (EXAMINED AND NAMED, BUT THE DESCRIPTIONS NOT YET PUBLISHED).

SPHAGNALES.

Fam. SPHAGNACEÆ.

Gen. SPHAGNUM Dill.

Sphagnum rigescens Warmst., Fret. Mag. occ.

ANDREÆALES.

Fam. ANDREÆACEÆ.

Gen. ANDREÆA Ehrh.

Andreæa loricata Dusén, Fuegia.

A. pachyphylla (C. Müll.) Dusén, Fuegia. (Syn. *Grimmia pachyphylla* C. Müll.)

A. pulvinatula Dusén, Fuegia.

A. purpurascens Dusén, Fuegia.

A. vermicularis Dusén, Fuegia.

BRYALES.

ACROCARPINEÆ.

Fam. DICRANACEÆ.

Subfam. *DICRANELLEÆ.*

Gen. ANISOTHECIUM Mitt.

Anisothecium persquarrosum Dusén, Patagon. occ.

Subfam. *DICRANEÆ.*

Gen. DICRANOWEISIA Lindb.

Dicranoweisia tenella Dusén, Patagon. occ.

Gen. DICRANUM Hedw.

Dicranum capillifolium Broth., Patagon. occ.
D. grandialare Dusén, Patagon. occ.
D. percompactum Dusén, Fret. Mag. occ.
D. perremotifolium Dusén, Patagon. occ.
D. peruncinatum Dusén, Patagon. austr.

Gen. CAMPYLOPUS Brid.

Campylopus flavo-nigritus Dusén, Fret. Mag. occ.; Patagon. occ.
C. occultoviridis Dusén, Fret. Mag. occ., Patagon. occ.
C. patagonicus Broth., Patagon. occ.
C. purpureocaulis Dusén mus., Fret. Mag. occ.
C. sordidonigritus Dusén mus., Fret. Mag. occ.
C. sulphureo-nigritus Dusén mus., Patagon. occ.

Subfam. *SELIGERIEÆ.*

Gen. BLINDIA Br. Eur.

Blindia globularis Dusén mus., Patagon. occ.
B. pseudo-robusta Dusén mus., Fret. Mag. occ.
B. sulphurea Dusén mus., Patagon. occ.

Fam. Pottiaceæ.

Subfam. *POTTIEÆ.*

Gen. BARBULA Hedw.

Barbula brachychæta Dusén mus., Patagon. occ.
B. flavido-pilosa Dusén mus., Patagon. occ.
B. marginato-serrata Dusén mus., Patagon. occ.
B. micro-runcinata Dusén mus., Patagon. occ.
B. nanophylla Dusén mus., Patagon. occ.
B. perangusta Dusén mus., Patagon. austr.

Subfam. *EUCALYPTEÆ.*

Gen. EUCALYPTA Schreb.

Eucalypta patagonica Broth. mus., Patagon. austr.

Fam. GRIMMIACEÆ.

Gen. GRIMMIA Ehrh.

Grimmia arachnoidea Dusén mus., Patagon. occ.
G. flexiseta Dusén mus., Patagon. occ.
G. pycnophylla Dusén mus., Patagon. occ.

Gen. RHACOMITRIUM Brid.

Rhacomitrium flavo-pallidum Dusén mus., Fuegia, Patagon. occ.

Fam. ORTHOTRICHACEÆ.

Gen. ORTHOTRICHUM Hedw.

Orthotrichum angustissimum Dusén mus., Patagon. occ.
O. hymenomitrium Dusén mus., Patagon. austr.
O. ligulatum Dusén mus., Fret. Mag. occ.
O. nigritellum Dusén mus., Patagon. occ.
O. paleomitrium Dusén mus., Patagon. austr.
O. perpusillum Dusén mus., Patagon. occ.
O. subassimile Dusén mus., Patagon. occ.

Gen. ULOTA Brid.

Ulota macrodonta Dusén mus., Patagon. occ.
U. persubulata Dusén mus., Patagon. occ.

Gen. MACROMITRIUM Brid.

Macromitrium spurio-crispulum Dusén mus., Patagon. occ.
M. sub-piliferum Dusén mus., Patagon. occ.

Gen. ZYGODON Hook. & Tayl.

Zydodon gracillimus Dusén mus., Patagon. occ.

Gen. PENTASTICHELLA C. Müll.

Pentastichella aurea Dusén, Patagon. occ.

Fam. BRYACEÆ.

Gen. BRYUM Dill.

Bryum ærugo Dusén mus., Fuegia.
B. anisodontaceum Dusén mus., Patagon. occ.

B. brevigemmatum Dusén mus., Patagon. occ.
B. demissum Dusén mus.
B. flavo-pallidum Dusén mus., Fuegia orientalis.
B. hamatum Dusén mus., Fret. Mag. occ.; Patagon. occ.
B. leuco-aristatum Dusén mus., Patagon. austr.
B. liliputanum Dusén mus., Patagon. occ.
B. myurella Dusén mus., Fuegia austr.
B. tenuirete Dusén mus., Patagon. occ.

Gen. WEBERA Hedw.

Webera timmiæcaulon Dusén mus., Fuegia; Patagon. occ.

Fam. BARTRAMIACEÆ.

Gen. ANACOLIA Schr.

Anacolia aurea Dusén mus., Patagon. occ.

Gen. BREUTELIA Sch.

Breutelia subelongata Broth. mus., Fuegia; Patagon. occ.
B. glabrifolia Dusén mus., Patagon. occ.

Fam. POLYTRICHACEÆ.

Gen. POLYTRICHUM C. Müll.

Gen. POLYTRICHADELPHUS C. Müll.

Polytrichadelphus stricticaulis Dusén mus., Patagon. occ.

PLEUROCARPINEÆ.

Fam. CRYPHÆACEÆ.

Gen. CRYPHÆA Brid.

Cryphæa mollis Dusén mus., Patagon. occ.

Fam. HOOKERIACEÆ.

Gen. DALTONIA Hook. & Tayl.

Daltonia patagonica Dusén mus., Patagon. occ.

Gen. ERIOPUS C. Müll. in herb.

Eriopus odontoloma C. Müll. in herb., Patagon. occ.

Gen. DISTICHOPHYLLUM Dz. & Mitt.

Distichophyllum crispatissimum Dusén mus., Patagon. occ.

Gen. PTERYGOPHYLLUM Brid.

Pterygophyllum lamellatum Dusén mus., Patagon. occ.

Fam. Leskeaceæ.

Gen. THUIDIUM Br. Eur.

Thuidium corralense Broth. mus., Fuegia austr.

Fam. Stereodontaceæ.

Gen. ECTROPOTHECIUM Mitt.

Ectropothecium spirifolium Dusén mus., Patagon. occ.

Gen. CLADOMNIUM Hook. fil. & Wils.

Cladomnium crenato-obtusum Dusén mus., Patagon. occ.

Fam. Sematophyllaceæ.

Gen. RHAPHIDOSTEGIUM Br. Eur.

Rhaphidostegium berberidis Dusén mus., Patagon. occ.
R. patagonicum Broth. mus., Patagon. occ.
R. polytrichadelphum Dusén mus., Patagon. occ.
R. strictipes Dusén mus., Patagon. occ.
R. tristifolium Dusén mus., Patagon. austr.

Fam. Hypnaceæ.

Gen. ISOTHECIUM Brid.

Isothecium serpens Dusén mus., Patagon. occ.

Gen. BRACHYTHECIUM Br. Eur.

Brachythecium cuspidarioides Dusén mus., Patagon. occ.
B. majusculum Dusén mus., Fuegia; Fret. Mag.
B. subtilicaule Dusén mus., Patagon. occ.
B. turgens Dusén mus., Fuegia austr.

Gen. RHYNCHOSTEGIUM Br. Eur.

Rhynchostegium byssicladum Dusén mus., Patagon. occ.
R. mollissimum Dusén mus., Patagon. occ.

Gen. RIGODIUM Kze.

Rigodium pseudo-thuidium Dusén mus., Patagon. occ.
R. carnosulum Dusén mus., Patagon. occ.

Gen. AMBLYSTEGIUM Br. Eur.

Amblystegium megachæte Dusén mus., Fuegia occ.

(Incertæ Sedis.)

Family CHARACEÆ. Stoneworts.

Aquatic cellular plants with segmented stems, the internode having one long axial cell, and the node consisting of several short cells. Whorled leaves, sometimes with axillary branches, arise from the node, and are themselves segmented and leaf-bearing; also bearing sexual reproductive organs at their nodes. Antheridia globular, bearing in their interior bundles of jointed filaments which produce many coiled and ciliated spermatozoids. Oögonia ovoid, consisting of 5 filaments spirally wound around a single egg-cell, and surmounted by crown-cells.

Species 160, in fresh or brackish water.

CHARA Linn.

Stem and leaves usually corticated by longitudinal cells, often becoming encrusted with lime. Spore-sac above antheridium. Crown-cells 5,

C. fœtida A. Braun (*C. vulgaris* Linn. p. p.).

Cortical tubules twice as many as the leaves. Whorls about 8-leaved; stipular circle double, weak.

South Patagonia: by J. B. Hatcher, near Rio de la Santa Cruz. Determined by the late T. F. Allen.

(Nearly cosmopolitan: as is *C. fragilis* Desv. the other section of *C. vulgaris* L., distinguished by its cortical tubules thrice as many as the leaves. Both are much encrusted and fragile.)

PTERIDOPHYTA, FERNS AND FERNLIKE PLANTS.

BY

G. MACLOSKIE.

(DETERMINATIONS BY LUCIEN M. UNDERWOOD.)

Family 1. OPHIOGLOSSACEÆ. Adder's-tongue.

More or less succulent plants consisting of a stem and leaf growing from a fleshy root. Sporesacs without annulus, crowded in one or more spikes or panicles, and opening by a transverse slit.

CHIROGLOSSA Presl. (Section of *Ophioglossum*.)

Frond broad, to 30 cm., palmately lobed. Spikes with 2-ranked sporesacs, several on base of frond and stipe.

C. PALMATA (Linn.).

Fig. in Engl. & Pr. i. 4. p. 478 B.
(W. Indies; Brazil; Bourbon I.); Patagonia.

BOTRYCHIUM Swartz.

Rootstocks fleshy, clustered. Frond pinnately parted. Fruit 1–3-pinnate, with rows of sessile sporesacs.

B. LUNARIA (L.) Sw. Moonwort.

Frond pinnately divided into fan-shaped segments, 10 cm. high.
Fig. in Britt. & Br. i. p. 3; Eng. & Pr. i. 4, p. 457.
S. Patagon., by Hatcher, "a var., or possibly an undescribed species, but the material insufficient." (L. M. Underwood.)

Fam. 2. HYMENOPHYLLACEÆ. Filmy-ferns.

Membranaceous, small, with slender creeping rootstocks. Leaves much divided. Sporesacs on marginal, usually elongated receptacles; with horizontal ring, and opening apically.

Species chiefly tropical; also many in New Zealand, and some in temperate climates.

TRICHOMANES Linn.

Indusium tubular or cuplike, sometimes 2-lipped.

Species 100, mostly tropical.

T. CÆSPITOSUM (Gaud.) Hook. (*Serpyllopsis antarctica* Besch.)

Frond once-pinnate, 5 cm. high; pinnæ small, entire, their surface horizontal, their rachis not winged. Reddish hairs on stipe and veins.

Patagonia to Cape Horn; Falklands. "Common on trunks of trees."

T. FLABELLATUM Bory.

Frond fan-shaped, orbicular, palmately divided halfway; the ultimate lobes short, linear, entire, 5 cm. high.

Falklands.

HYMENOPHYLLUM Linn.

Indusium 2-valved, receptacle not protruding.

Species at least 100, chiefly tropical.

H. ABRUPTUM Hook. f.

Glabrous, 25 mm. high. Frond oval-triangular, once-pinnatifid; pinnæ at most simply forked. Main rachis broad-winged below.

(W. Indies; Brazil); Patagon.; Clarence I. (var. *brevifrons*).

H. ÆRUGINOSUM Carm.

10 cm. Stipe tomentose. Frond thrice pinnatifid, pubescent. Main rachis winged above. Ultimate segments linear with terminal sori.

(Tristan); W. Magellan.

H. BRIDGESII Hook.

12 cm. Frond ovate-triangular, thrice-pinnate. Rachis slightly winged above. Ultimate segments narrow-linear, rigid, not crisped, spinulose-toothed. Sori at base of pinnules.

(Melville I.); Fuegia (by Dusén).

H. CÆSPITOSUM Christ.

Low, densely cespitose, 2–3 cm. Its 12–15 pinnæ spirally arranged, simple or bipartite. Sori ?

W. Patagon.; S. Fuegia (by Dusén).

H. CAUDICULATUM (Mart.) var. CAUDATUM Bosch.

Stipe to 15 cm., broad-winged above. Frond thrice-pinnatifid; main rachis with a crisp wing; var. also with the secondary rachis winged. Sori apical on the segments.

Chonos Archip. S. Patagonia, Otway.

H. CRUENTUM Cav.

10 cm. Frond simple, sinuate, glabrous. Sori at apex of the sinuations.

Fig. in Eng. & Pr. i. 4. p. 109. A. Patagonia, Otway.

H. DICHOTOMUM Cav.

To 20 cm. Frond and segments crisped, twice to thrice-pinnatifid. Stipe and rachis winged. Ultimate segments broad-linear. Sori in their axils. Valves of indusium spinose.

(Chili); W. Magellan. Otway.

H. DICRANOTRICHUM (Presl.). (*H. chiloënse* Hook.)

7 cm. Frond ciliated, hairy, twice-pinnatifid. Rachis zigzag, ciliated and winged. Stipe not winged. Sori singly at base of pinnæ, only on the upper side.

Chonos Archip.; Chiloe; Otway.

H. DUSENII Christ.

Mosslike, cespitose, 5 mm. high. Frond once-pinnate; pinnæ pectinate; their segments ligulate-linear, with rufous apex and dark single nerve. Margin ciliate. Sori?

W. Magellan; S. Fuegia at 500 meters elevation.

H. FALKLANDICUM Baker.

4 cm. Stipe filiform. Frond not crisped, twice-pinnatifid. Rachis flexuous, filiform; ultimate lobes ligulate, ciliate-toothed. Sori solitary at base of upper pinnæ.

Falklands.

H. MAGELLANICUM (Desv. sub *Didymoglossum*) Hook. & Bak.

To 20 cm. Stipe and rachis winged throughout. Frond thrice-pinnatifid; its ultimate segments spinulose-toothed. Sori 6–10, terminal.

(Chili; Organ Mts.); Chiloe; W. Magellan, Churucca, on old trees.

H. NIGRICANS Colla. (*H. tortuosum* Hook., non Banks.)

15 cm. Stipe wiry, it and rachis winged throughout. Frond crisped, broad ovate-triangular, thrice-pinnatifid. Ultimate segments linear, toothed. Sori 10–∞, terminal on the pinnules.

(Chili); Patagon., and adjacent Is., to Cape Horn.

H. PECTINATUM Cav.

To 18 cm. Stipes wiry. Fronds pinnate: rachis winged next apex. Pinnæ winged on lower, pectinate on upper side. Sori terminal on proximal segments of upper side. Beautiful.

Chonos Archip.; W. Magellan., "common on trunks of trees and rotting wood." (Dusén.) Patagonia, Churucca.

H. PELTATUM Poir. ("oldest name" W. J. Hook.). (*H. tunbridgense* Sm. var. *wilsoni* Hook.)

5 cm. Frond pinnate; the pinnæ distichous, and pinnatifid on their upper side only. Margins spinulose-toothed. Rachis and upper part of stipe winged.

(Norway; British Isles; Australia; N. Zeal.; Chili); Chonos to Cape Horn; Falklands.

H. RARUM Br. (*H. darwinii* Hook.)

12 cm. Glabrous. Twice-pinnatifid; with winged rachis. Sori large, terminal on the broad segments.

(S. Afr., Tasmania; N. Zeal.); Patag., Fuegia; Falklands; Staaten I.

H. SECUNDUM Hook. & Grev.

8 cm. Frond pinnate; pinnæ recurved, flabellate-pinnatifid. Ultimate segments linear-spinulose-toothed, falcate, secund. Sori solitary at base of pinnæ on upper side.

W. Magellan., on mossy soil in woods near Churucca. Fuegia to Cape Horn; Staaten I.

H. SUBTILISSIMUM Kunze.

20 cm. Stipe wiry, tomentose. Frond hairy, thrice-pinnatifid. Rachis slightly winged above. Ultimate segments broad-linear, with copious tawny stellate hairs. Sori terminal.

(New Zealand; Chili; Fernandez); Chiloe; Patagonia, Otway; Fuegia to I. Hoste.

H. TORTUOSUM Banks & Sol.

15 cm. Stipe and rachis winged. Frond crisped, thrice-pinnatifid. Ultimate segments linear, toothed and wavy. Sori numerous, terminal on the segments.

Chonos Archip., Fuegia throughout; S. Patagonia (by Hatcher).

Fam. 3. CYATHEACEÆ.

Mostly tree-ferns with large compound fronds. Sessile or stalked sporesacs, with complete ring, obovoid and crowded on a convex receptacle, opening by a transverse slit.

Chiefly tropical; also in colder parts of S. Amer. and in Tasmania and New Zealand.

ALSOPHILA R. Br.

Sori globose, dorsal on a vein or the forking of a vein, mostly hairy. Indusium none.

Species 150, S. America; Africa; Pacific Is.

A. PRUINATA Kaulf.

Thrice-pinnate; pinnæ 40 cm. long, hoary, white underneath. Leafstalks woolly. Sori solitary near the chief nerves, one or more to each lobule.

Mex. and W. Indies; S. Amer. (Fig. in Eng. & Pr. i. 4. p. 133. C.) Patagonia, Otway (Savatier). "Not previously observed south of Juan Fernandez I. Its occurrence in Patagonia is a very interesting fact" (A. Franchet).

Fam. 4. POLYPODIACEÆ.

Ferns of varying habit, coiled in vernation. Sporesacs mostly with incomplete vertical rings, opening transversely; stalked; their clusters (sori) on the underside of the fronds, or on contracted fronds; mostly with an indusium.

Species about 3000, cosmopolitan.

BLECHNUM Linn.

Sori in continuous lines, not marginal, one on each side of the midrib, with a continuous indusium, which opens towards the midrib. Veins forked.

Species 20, chiefly trop. and s. temp.

B. PINNA-MARINA (Poir.) Mitt. (*Lomaria alpina* Spr.)

Rhizome slender, wide-creeping. Frond 15 cm. long, pinnate; the pinnæ 12 mm. long, 3 mm. broad, obtuse. Fertile frond longer than the barren.

(N. Zeal.; Austral.; Kerguel.; Tristan; Brazil); Magellan; Fuegia to Cape Horn; Falklands; S. Patagonia (by Hatcher).

B. TABULARE (Thun.) Kuhn. (*Lomaria magellanica* Desv.)

Stout, 30–60 cm. high. Barren frond ovate, with small pinnæ. Fertile pinnæ linear, close. Often shortly treelike, the stem covered with linear-sagittate scales. Indusium fimbriated.

(S. Afr., Mascarenes; Tristan); W. Indies to Fuegia. Patagonia, at Puerto Bueno.

ASPLENIUM Linn.

Sori linear to oblong, with indusia of the same shape, oblique and opening towards the midnerve.

Species 350, widely distributed.

A. MAGELLANICUM Kaulf.

Stems tufted, wiry, ebeneous below, 8 cm. Frond deltoid, pinnate, and the lower pinnæ pinnate, and twice pinnately divided, with incised-serrate segments. Sori copious, at length covering all the surface.

Magellan; Fuegia to Cape Horn; S. Patagonia (by Hatcher).

A. MULTIFIDUM Brack.

Stout. Frond ample, to 60 cm. across, subdeltoid, 4 times pinnate. Ultimate segments oblong-spatulate, toothed. Sori marginal, 1 to each division.

S. Fuegia (allied forms in S. Afr., Austral., N. Zeal., and Hawaii).

DRYOPTERIS Adans. 1763. Shield-ferns.

(*Aspidium* Sw. 1800. *Polystichum* Roth. 1797.)

Ferns with round sori, and peltate or cordate-reniform indusia, these fixed by the sinus or center. Fertile and sterile fronds similar. Stipe not articulated on the rhizome. Sporesacs with incomplete vertical ring, bursting transversely.

Species 350, widely distributed.

D. ACULEATA (L.) O. Kuntze.

To 1 meter. Frond ovate-lanceolate, once-pinnate, and the lower pinnæ again pinnate; coriaceous, evergreen. Teeth awned. Scales on stalk and rachis. Sori in 2 rows near midveins.

Fig. in Eng. & Pr. i. 4, p. 192 A.

Cosmopolitan; rare in U. S. S. Patagonia (by Hatcher).

D. ADIANTIFORMIS (Forst. 1786) O. Kuntze.

(*Polypodium coriaceum* Sw. 1788.)

Frond subdeltoid, 60 by 40 cm., once-pinnate and the lower pinnæ twice-pinnatifid, the teeth not mucronate. Rachis polished. Sori broad, in 2 rows, filling nearly all the space.

(New Zealand & Pacific Is.; Austral.; Mascarenes; S. Africa; Cuba to Patagonia); S. Patagonia by R. Sta Cruz; Lago Argentino; Fuegia, Beagle Canal.

D. MOHRIOIDES (Bory) O. Kuntze.

Stout, 25 cm. high. Frond once-pinnate, and the lower pinnæ again pinnate, the segments obtuse, not awned, slightly toothed. Stem and rachis scaly. Sori copious.

(Marion I., Chili); Patagonia; W. Magellan at an elevation of 500 meters (Dusén).

D. VESTITA (Forst.).

To 50 cm. Pinnæ once-pinnate, and the lower pinnæ again pinnate. Rachis with red-brown fibrillæ and dark brown scales. Teeth awned. Sori 2-seriate, nearer the midnerve.

(Tasmania; Auckland Is.); S. Fuegia.

FILIX Adans. 1763. (*Cystopteris* Bern. 1811.)

Fronds all flat. Sori roundish; indusium partly inferior, fixed by a broad base, and enclosing the sorus as a hood.

Species 5, chiefly in northern zone.

F. FRAGILIS (Linn. sub *Polypodium*).

Rhizome short, densely leaved, 25 cm. high. Frond ovate-lanceolate, thrice-pinnatifid; rachis winged above. Ultimate segments rather long, toothed. Sori 2–12 to a pinnule, indusia early withering.

Fig. in Eng. & Pr. i. 4, p. 163 A-C; Britt. & Br. i. p. 13.

(In cold climates, and tropical mountains, nearly cosmopolitan); Magellan; S. Fuegia; Falklands.

POLYPODIUM Linn.

Fronds articulate on the rhizome, usually all similar, simple or pinnate. Sori round or nearly so, without indusium. Sporesacs with vertical ring, opening transversely.

Species 350, mostly tropical.

P. AUSTRALE (Br.) Mett. (*Grammitis australis* Br.)

Rhizome short, creeping, scaly. Fronds fasciculate, their stipes short, their laminæ 15 cm. long, 1.5 cm. broad, spatulate. Sori rather long, near the midnerve.

(Austral., New Zealand at 1,500 meters elevation; Marion I.; New Caled.; Tristan); Patagonia; W. Magellan, in Desolation I. on stems of trees (Dusén); Fuegia, Camden I.

P. AUSTRALE NANUM Brack.

Densely cespitose. Fronds only 10–15 mm. long, stipe included.

W. Magellan, heights near Packsaddle Anchorage.

Fam. 5. GLEICHENIACEÆ.

Sori terminal, dorsal, or on the ends of the veins, small, of few sessile or subsessile sporesacs, and with no indusium. Ring transverse, complete; sporesacs opening by vertical slits. Veins free.

Species 26, tropical, and southern.

GLEICHENIA Smith.

Rhizome creeping. Leaves usually spreading, veins forked.

Species 25.

G. CRYPTOCARPA Hook.

Frond proliferous with yellow-brown branches, dichotomously fan-shaped. Pinnæ pectinate; their segments narrow-linear, with involute margin concealing the sori.

Chili; Chiloe; Falklands.

G. QUADRIPARTITA Hook. (*G. acutifolia* Hook.)

Frond black when dry, reddish underneath, and chaffy on the costæ, not proliferous, but once forking, and each branch fanways dichotomous. Pinnæ lanceolate, acuminate, falcate, pectinate, 12 cm. long.

Magellan, at Port Famine, & W. Magellan, Churucca.

Fam. 6. SCHIZÆACEÆ.

Leaves simple or pinnate. Sporesacs in spikes or panicles, ovoid, sessile, with a small apical ring, opening by a vertical slit.

Species 75, mostly tropical.

SCHIZÆA Smith.

Small, slender ferns with filiform, linear fronds; the fertile longer than the sterile, bearing close distichous spikes.

Species 16.

S. AUSTRALIS Gaud.

Fronds not forked, wiry, subterete, 4 cm. long by .5 mm. broad, channeled in front. Fertile frond with about 6 short spreading spikes on each side.

(Auckland Is. "Common on hard soil where nothing else grows save lichens." J. D. Hooker); Falklands.

Fam. 7. SALVINIACEÆ. Water-ferns.

Small floating plants, with 2-ranked leaves on an axis circinately developed, and 1-celled sporesacs having a central receptacle, megasporangia and micro-sporangia in different fruits.

Species 20, widely distributed.

AZOLLA Lam.

Leaves minute, 2-lobed, a larger floating and a smaller submerged lobe on pinnately branching stems. Masses of microspores with glochidia.

Species 5.

A. FILICULOIDES Lam. (*A. magellanica* Willd.)

Racemosely branching; a root on every branch. Upper leaf-lobes with 1-celled, broadly based hairs. Leaves closely imbricating, oblong, obtuse, membranaceous margined, not reddish.

Figs. in Engl. & Pr. i. 4, pp. 385, 388, 396, 397.

(California to Chili, Brazil, & Patagonia); S. Patagonia, in stagnant waters.

Magellan; Falklands.

A. caroliniana W. (of N. America, to Calif. and by New Mexico to S. America) has spreading leaves, reddish below, not membranaceous at the margin. (Vid. in B. & B., I, p. 35.)

Fam. 8. EQUISETACEÆ. Horsetails.

Erect plants with jointed hollow and fluted stems, having whorled branches and leaves reduced to sheaths at the joints. Sporesacs 1-celled, suspended under the peltate polygonal scales of the terminal cone-like spikes. Spores of one kind, with 4 club-shaped elaters.

Species 25, widely distributed.

EQUISETUM Linn.

The only genus at present existing.

E. RAMOSISSIMUM H. B. & K.

Stems erect, to 1.5 meters tall, terete, as thick as the little finger, the ribs swollen, not angulate; sub-simply branching, the branches 6–10 at each joint, glabrous, hexagonal, themselves with one or two branchlets. Rows of stomata 1–4 in the same plant. Teeth of sheaths spreading, membranaceous, whitish, acute.

(Widely distributed. Got by Trelease in the Azores; Caraccas); at Bahia Blanca, and probably in N. Patagonia (may be that seen by Hatcher in Laguna Leona, Vol. I, p. 41).

Fam. 9. LYCOPODIACEÆ. Clubmosses.

Mosslike erect or trailing land plants with dichotomously dividing axes ending in spikes. Sporecases in the leaf-axils of the spikes, spores all of one kind, without elaters.

Species existing above 100; abounding most in the Andes and Himalehs; some are cosmopolitan.

LYCOPODIUM Linn.

Roots fibrous, not tuberous. Leaves all cauline, small and simple, usually imbricating.

Species about 100.

L. CLAVATUM Linn.

Main stem creeping, 30–120 cm. or longer, leafy; sparingly rooting and horizontally branching, and sending up aërial stems. Leaves crowded, incurved, mostly bristle-tipped, the lower toothed, the upper subentire. Spikes 1–4, cylindrical, on long, 8-striate peduncles. Spore-cases reniform. (B. & B., I, p. 43.)

(Eurasia; N. Amer. to S. Amer.)

L. CLAVATUM FASTIGIATUM Hook.

Branches erect, fastigiate.

Patagon., Fuegia to Cape Horn.

L. CLAVATUM MAGELLANICUM Hook.

Leaves more or less curved, apically awnless.[1] Spike solitary and sessile in starved alpine specimens; 2 or more on a peduncle in others. Bracts ovate-lanceolate, acuminate.

(Auckland I.; Campbell's I., Kerguelen); Falklands; Patagonia, Fuegia to Cape Horn (by Hatcher).

L. CONFERTUM Willd.

Stem appressed, about 45 cm. long, rooting and branching; the branches alternate, to 5 cm. long, and alternately branching. Leaves sparse or crowded, linear-lanceolate, acute, secund. Spikes solitary, sessile on ends of ascending branches, 12 mm. long, leafy; their leaves exceeding those of the stem.

(Chili); Patagonia.

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[1] In Lloyd and Underwood's Review of N. A. Species of Lycopodium (Torr. Bull., Ap., 1900) this awnless condition of the leaves is mentioned as characterizing *L. clavatum* Linn. when found in the northwest of North America.

L. SAURURUS Willd.

Stem simple or bifid, erect, about 30 cm. high. Leaves sparse, about 8-seriate, lanceolate, acute, concave, entire, closely imbricate.

(Kerguelen, Bourbon, Tristan, St. Helena, Peru); Falklands.

Fam. 10. ISOETACEÆ. Quillworts.

Aquatic or marsh-plants consisting of rosettes of thick grasslike fronds rooting in mud and bearing megasporangia and microsporangia in their swollen, excavated bases.

Species 50, widely distributed.

ISOETES Linn.

The only genus.

I. SAVATIERI Franchet.

Amphibious, the submerged reaching 20 cm. in length; the emersed about 4 cm. Leaves stout, becoming subtetragonal above and spiny tipped. Sheath broad (7–10 mm.), dorsally sulcate, as if 2-lobed. Macrospores white, rugose, the rugæ anastomosing. Microspores brown, muricate, laterally crested.

Magellan, by lakes near Puerto Bueno; at Cape Horn; in W. Magellan, Desolation I. (Dusén).

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VOLUME VIII

BOTANY

PART V. FLORA PATAGONICA. SECTION I

PINACEÆ-SANTALACEÆ

BY

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(Pp. 139–338 Pl. XII–XIV)

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PART V.

FLORA PATAGONICA.[1]

FLOWERING PLANTS.

BY

G. MACLOSKIE.

NOTE ON THE DESCRIPTIVE LIST OF FLOWERING PLANTS.

For the convenience of botanists this part aims to gather in one general list the descriptions of the Patagonian Flora which are scattered over many books. Extreme condensation is required by the limitations of space; and as we deem a natural serial arrangement of species an impossibility, we have placed the species of each genus in alphabetical order, which facilitates reference. In order to minimize the labor of identification, all the larger genera are provided with an artificial key to the species, whereby any plant may be paralleled with its congeners, and its name provisionally obtained for comparison with its diagnosis in the ensuing alphabetical arrangement.

The arrangement and diagnoses of the families and genera are in accord with Engler and Prantl's *Pflanzenfamilien*, with occasional help from the writings of Bentham, Gray, Britton and others. Immediately after the descriptive list we give an analysis of the Alliances and Families of the Flowering Plants of the area; this follows the method of Engler and Prantl, as modified by Coulter and Chamberlain.

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[1] For Conspectus of Orders and Familes see below, Part VI.

REESE

Subkingdom PHANEROGAMIA (SPERMATOPHYTA). Flowering or Seed-bearing Plants.

The sexual generation is so far reduced as to be apparently obsolete; the non-sexual generation, or sporophyte, is advanced, heterosporous, with conspicuous secondary sexual characters which constitute flowers; the female sporophyls bear carpellary leaves, ultimately supporting seeds which contain the embryo; the male sporophyls form stamens and bear pollen.

Section 1. GYMNOSPERMÆ.

Trees or shrubs with unisexual flowers, in which the germinating pollen forms prothallium-cells, one of these in each pollen-grain developing into a siphonal antheridium; the scale-like ovuliferous carpels not developing into a closed ovary around the seeds.

Class I. CONIFERÆ.

Stems branched, without ducts in the wood, but usually with some resiniferous canals. *Leaves* simple, mostly small or needle-formed. *Flowers* naked, mostly in cones, the staminal in catkins.

Family 1. PINACEÆ. Pines and Firs.

With regular cones having seeds inserted between their scales. Seed-coats leathery or woody or bony. No outer integument (arillus).

Leaves spirally arranged. *Seeds* usually inverted.

Section Araucarineæ has the carpels single (no division into cover and fruiting scale; but sometimes a tooth-like scale on the inside). Seed only one in each carpel, inserted on its center and inverted.

ARAUCARIA Juss. Chilian-pine.

Cones terminal, on normally or abnormally-leaved short shoots; the *male* cones cylindric-conical, large, stamens very numerous, pollen-sacs linear, 8–15 in a close ring. *Fertile* cones globular, ultimately breaking up.

Carpels sometimes under the point of a tooth-like ligule, woody, cuneate-prismatic. *Endosperm* mealy. *Cotyledons* 2–4. Large evergreen trees with naked buds. *Leaves* large, scale-like, or short and needle-form, sessile with a broad base, and partly decurrent. *Fruit* ripening in 2 years.

Species about 6: South America and Australasia; some fossil.

A. IMBRICATA Pav.

Branches horizontal or depressed, the ends ascending again. *Leaves* lanceolate, pungent, stiff, closely imbricate-appressed. *Stamens* and *carpels* long-pointed.

South Chili, about 35–40° S. lat., along with *Fitzroya patagonica* forming woods at high altitudes (to 1,000 meters), and yielding both timber and edible seeds. In islands of Lago Nahuelhuapi.

Dusén describes a fossil *Araucaria nathorsti* Dus., in the Tertiary at Punta Arenas. Its leaves are like those of *A. imbricata*, but not long-pungent at the apex. The silicified wood of *Araucarioxylon schleinitzii* Goeppert occurs both in Magellan and on Kerguelen Island.

Araucarites ovatus Hollick is fossil in the Cretaceous beds of New New Jersey, U. S.

Family 2. CUPRESSACEÆ. Cypress Family.

Leaves cyclic in whorls of 2–3–4. *Cones* woody or fleshy. Seeds 1–many in each carpel, usually upright. Stamens 4–5 in a whorl. Pollen not winged.

1. FITZROYA Hook. f.

Tree with 3-merous whorls of lanceolate leaves (in the Patagonian species, but a shrub and 2-merous in the Tasmanian). Round small *cones* having 2–3 pairs of carpels. Upper *carpels* 3-seeded (no seeds in the lower carpels).

F. PATAGONICA Hook. f.

A stately tree with minute spreading lanceolate leaves.

N. Patagon. even in swampy woods; by Valdivia, and Lago Nahuelhuapi.

2. LIBOCEDRUS Don.

Trees or shrubs, the *leaves* 2-whorled (by crowding 4-whorled), of two forms, the front-leaves on the branches small, appressed and scale-like, the side-leaves long with the apex free. *Cone* woody, having only 4, rarely

6, unequal scales, the outer ones smaller; and 4 carpels, the upper pair each 2-seeded. *Seeds* each with a large and a small wing. (Fig. in Eng. & Prantl., ii, 1, 97.)

L. TETRAGONA Endl. (*Thuja t.* Hook.)

Bark reddish; the strobiliferous branch exceeding the strobile.

S. & W. Patagon.; Magellan through Fuegia to Cape Horn; under the snow-line of the mountains; the only "needle-tree" of the Magellan lands. Common in islands of Lago Nahuel-huapi. Stem varying according to place from 50 centimeters to 50 meters high. This genus has species in S. Chili, California, China, Japan, New Caledonia and New Zealand. Allied to the amber-trees of Europe and North Greenland. *L. chilensis* Endl. with *branches* compressed and *leaves* acute, and strobiliferous branch shorter than the strobile, extends southward in the Chilian Andes to Valdivia, 40° S. lat.

Family 3. TAXACEÆ. Yew Family.

Cones incomplete: seeds exposed, with an epimatium, or excrescence from the carpel; often a fleshy cup.

Subfamily *PODOCARPEÆ.*

Seeds more or less inverted, only 1 to each carpel. *Stamens* with 2 pollen-sacs; *pollen-grains* with wings. Flowers mostly diœcious.

(1) Scales of female cone very few or many, often fleshy, spirally crowded.

1. SAXEGOTHEA Lindl.

An evergreen tree with linear plane to needle-shaped *leaves*, in 2 divergent rows. *Carpels* numerous, the scales at length fleshy and coalescing into a round fleshy *cone* opening downwards. Monœcious.

Species 1, viz:

S. CONSPICUA Lindl. (*Taxus patagonica* Hort.)

Leaves with 2 white stripes underneath.

Only in lower regions of the Patagonian Andes and in Chili.

2. PODOCARPUS l'Her.

Trees or shrubs, with spiral, rarely opposite *leaves*, which are flat-needle-form or broad, and pungent, the margins revolute. Fruiting *peduncles*

1-flowered, very short. *Seeds* each exceeding its carpel; the whole in an outer aril resembling a drupe.

P. NUBIGENA Lindl.

Leaves linear-mucronate, glaucous underneath. *Peduncles* shorter than the obliquely 2-lobed obovate receptacle. *Fruits* oblong, apiculate.

With *Fitzroya* near Valdivia and southward in Chili and West Patagonia.

The genus has 40 species scattered over the southern hemisphere. *P. spicata* Br. of New Zealand and *P. andina* Poepp. of South Chili are closely allied.

(2) Scales of female cone 4, united below to form a woody cone which is enclosed by 4 upper enlarged leaves.

3. DACRYDIUM Sol.

The *pistillate* flower solitary at the top of the branches. *Fruit* an ovoid nut in a firm rugose integument, with involucrate bracts.

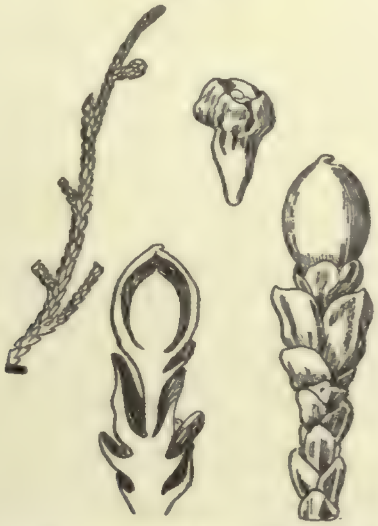
Species 12, in Malaya, Tasmania, New Zealand, Fiji, Australia; few in Africa; the following in Chili and Patagonia. Some are tall trees.

D. FONKI (Phil. sub *Lepidothamnus*) Benth.

Dwarf; with crowded small scaly leaves, and also spreading leaves.

(Chilian Andes to 44° S. lat.); Patagonia, near Lago Argentino; Wellington Island, Port Eden. (Fig. 27.)

FIG. 27.



Dacrydium fonki. Branch with floral shoot; and enlarged view of young flower, of fruiting shoot, and section of fruit. (After Franchet.)

Class II. GNETACEÆ. Joint-firs.

Stems simple or branched, often jointed, with ducts in the wood, but not resinous. *Leaves* opposite, simple, often reduced to scales. *Flowers* with a small, 2–4-merous perianth. *Seeds* in the Patagonian forms fleshy, like small grapes.

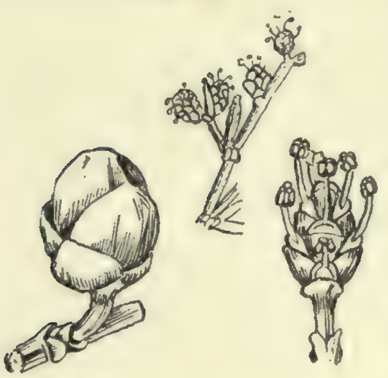
Family 4. Ephedraceæ.

Characters of the genus, viz:

EPHEDRA Linn. Joint-firs, Sea-grapes.

Leafless shrubs, with many *branches* jointed at the nodes, longitudinally grooved like Equisetum, the branches opposite or fascicled and subtended by pairs of leaf-scales which represent the reduced leaves. *Flowers* mostly diœcious, the male flowers in compound inflorescences, each with a 2-leaved perianth, and bearing 2–8 anthers on a common axis. The *female* flowers having a tubular perianth contracted above, around one erect ovule, whose integument emerges as a tube-like micropyle; in spikelets of 2–8. *Fruit* berry-like from red fleshy bracts. (Fig. 28.)

Fig. 28.



Ephedra nana. Branch, natural size; female and male flowers, enlarged. (After Dusén.)

Species 30, over the Mediterranean region (Tyrol to North Africa) the Himalayas, Altai, Orient, mountains of America, from California by Texas to Chili, Argentina, and North and South Patagonia.

Sometimes the fruit is used medicinally and as food. "At Pingopingo in Atacama the mules eat the branchlets of *E. andina* (Poepp.) and men eat the fruit sc. the red fleshy bracts which are insipid." (R. Philippi.)

(1) Monœcious.

1. E. americana Humb. & Bonpl.

Much branching, the *branches* fasciculate, terete, striate, with bifid sheaths in the young branches ending in subulate leaves. *Male* catkins 1–2, sessile at the joints; *anthers* 4–7, sessile, making a globose head on a short style. *Female* catkins 1–several, subsessile, 2-flowered. *Involucres* 4–6, deeply bifid, the uppermost equalling the oval pistils.

N. Patagon. and by the Andes to Quito.

2. E. TWEEDIANA Fisch. & Mey.

Subscandent shrub. Sheaths short, deeply bifid laciniate. *Male* catkins aggregate at the joints, sessile; *anthers* 4–5, scarcely stipitate. *Female* catkins solitary or aggregate, sessile or nearly so, 2-flowered; the upper involucre bifid to the middle, as long as the ovate-oblong pistil.

N. Patagon. and Argentina.

(2) Diœcious.

3. E. FRUSTILLATA Miers.

A stunted shrub 10 cm. high with creeping caudex and reddish-brown sulcate branches. Internodes only 12 mm. long, with whorled branches at the nodes; 2 sheathing leaf-scales round each node. Male and female plants similar; flowers on the ultimate branchlets. *Male* catkin solitary, terminal with 4–6 pairs of decussating imbricating bracts. Anthers 5, globose, sessile on the exserted staminal column. *Female* plant crowded with larger dark-brown flowers, 4 at each node on short peduncles.

Chubut; S. Patagon. (Rio Sta. Cruz, J. B. Hatcher, Dec. 28, 1896.)

4. E. OCHREATA Miers.

Shrub with virgate branches and stout striatellate branchlets; internodes 5 cm. long with 3–4 leaf-scales 8 cm. long, united into a sheath ending in long excurrent points. *Male* catkins sessile, 4 at each node, enclosed by the sheath; containing each 25–30 flowers. *Female* catkins short-peduncled, 2–4 at each node with 5-seriate involucre of decreasing pairs. *Fruit* as 2 terminal achenes, turning downwards, with the apical micropyle scarcely exserted.

S. and N. Patagon. and Argentina.

5. E. PATAGONICA Phil.

Very branching. Internodes only 9 mm. long, striate, sulcate and smooth. Sheaths little cleft, the uppermost divided into broad-ovate lobes. *Male* catkins usually solitary on the peduncles. Anthers 3–4, rarely 5; staminal column scarcely exceeding the involucre. *Female* catkins solitary, 4-flowered; scales of involucre ovate, narrowly margined.

S. Patagon.; Lake Pinto.

(Possibly the same as *E. frustillata.*)

Section II. ANGIOSPERMÆ.

Flowering plants whose carpels become closed ovaries, and are surmounted by stigmas which receive the pollen and conduct the growing pollen-tubes to the enclosed ovules.

Class I. MONOCOTYLEDONES.

Seeds with a monocotyledonous embryo. *Flowers* usually 3-merous. *Stem* endogenous. *Leaves* mostly with parallel venation.

Including families 5–21; also the palms and several other families which are not found in Patagonia.

Family 5. TYPHACEÆ. Cat-tail Family.

Marsh or aquatic plants with creeping rootstocks and glabrous erect terete stems. *Leaves* long-ensiform. *Flowers* monœcious, in dense terminal spikes. *Male* flowers above; each with 2–7 stamens. *Ovary* 1–2-locular. *Perianth* of bristles; other bristles inwards. *Seeds* with endosperm.

Typha, the only genus. Species 10, in temperate and tropical regions.

TYPHA Linn.

1. T. ANGUSTIFOLIA Linn.

Stem slender. *Leaves* 4–12 mm. broad. *Spikes* light brown, a gap between the staminate and pistillate flowers. *Stigmas* linear. *Pollen-grains* simple.

(Eurasia and E. United States.) Argentina and North Patagonia; in swamps near Carren-leofú.

"Cosmopolitan; probably disseminated by water-birds." (J. Ball.)

2. T. DOMINGENSIS Pers.

Robust, 2–4 meters high. *Leaves* 5–10, plane, the lower 20 mm. broad. *Spikes* mostly remote. Hairs of *male* spikes rusty-brown, mostly dilated at apex, with curved branches. *Female* spike brown; flowers bracteolate, pedicels 1 mm. long. Hairs apically brown, shorter than the stigmas.

Texas and southwards to Argentina and North Patagonia and West Indies.

Family 6. POTAMOGETONACEÆ. Pondweed.

Submerged plants with kotty-jointed stems and alternate (rarely opposite) leaves. *Flowers* small, 1-sexual or hermaphrodite, regular, perianth 4-leaved or none or a cup. *Anthers* 4 or 2, sessile. *Carpels* 1 or more, usually free; each with 1 pendent seed. *Achenes* hard or leathery. Endosperm none.

Species 25, chiefly of temperate zones.

KEY TO THE GENERA.

1. Flowers naked, at length long-stalked. Leaves slender, acuminate. In brackish water. 1. *Ruppia.*
2. Sepals 4. Flowers spicate. Leaves of two kinds, the floating broader than the submerged. Chiefly in fresh water. 2. *Potamogeton.*

1. RUPPIA Linn.

Stems capillary, branching. *Leaves* slender, 1-nerved, acuminate, with thin sheaths. *Flowers* monœcious, in a spathe, at length long-peduncled, having two sessile anthers and two sets of *pistillate* flowers on opposite sides of the rachis; without perianth (or a single hermaphrodite flower having 2 stamens and 4 carpels). The *male* flowers fall off and after fertilization the peduncles twist, drawing the ripening fruit below the water.

R. MARITIMA Linn.

Leaves 2–7 cm. long, .5 mm. wide. Drupes stipitate, 2 mm. long. (Cosmopolitan, in brackish water); S. Patagon. (Dusén).

2. POTAMOGETON Linn. Pondweed.

Leaves flat, often of two kinds, submerged and floating; the floating being firmer and broader. *Spathes*, or stipules, at base of the leaves or the petioles, and usually perishing soon after expanding. *Peduncles* axillary, usually emersed, bearing a spike of small flowers. Perianth-leaves, stamens and carpels each 4. *Seeds* curved.

Species 65, in temperate regions.

KEY TO THE SPECIES.

a. Leaves floating and submerged.
  b. Stipules free. Fruit pitted.
    c. Submerged leaves reduced to petioles. *natans.*
    c2. Submerged leaves with lamina. *fluitans.*

b2. Stipules 2-ribbed, persisting. Submerged leaves tongue-shaped. Fruit keeled and beaked. *linguatus.*
a2. Leaves all submerged.
b. Stipules free.
c. Leaves narrow-oblong, serrulate, 3–7-nerved, glandless. Fruit beaked. *crispus.*
c2. Leaves linear, with 2 small basal glands. Fruit ellipsoid.
d. Leaves 5–7-nerved. Fruit laterally 2-pitted. *friesii.*
d2. Leaves 3-nerved. Style short. *pusillus.*
b2. Stipules half-adnate. Leaves setaceous. Fruit scarcely keeled. *pectinatus.*
b3. Stipules adnate. Leaves linear. Fruit 3-keeled. *interruptus.*

1. P. CRISPUS Linn.

Leaves 2-ranked, linear-oblong or oblanceolate, alternate or opposite, sessile or amplexicaul, obtuse, crisped serrulate, the midrib often compound with submarginal outer nerves. *Stipules* small, scarious, evanescent. *Peduncles* 4 cm. long. Spikes 12 mm. long, bristly, having beaked drupelets. *Fruit* ovoid; also with winter-buds. (Britt. & Br. i, 72.)

In ditches and sluggish streams of temperate regions.

2. P. FLUITANS Roth.

Like *P. natans*, but the submerged leaves have a lamina; *leaf-stalks* flat on the upper sides; floating leaves long-petiolate, lance-ovate, attenuate both ways, rounded or narrowed at the base. Rachis thicker than the peduncle.

In temperate and tropical climates, by J. B. Hatcher in S. Patagon.

3. P. FRIESII Ruprecht.

Stems compressed, branching. *Leaves* about 10 cm. by 2 mm., mostly 5-nerved, with 2 small glands at the base. *Stipules* white-hyaline, about 20 mm. long. *Peduncles* 3 cm. long; spike interrupted; *drupelets* ellipsoid, dorsally grooved, with a pit on each side; style recurved.

(Temperate parts of Eur. and N. Am.); Rio Coy, Patagon. (J. B. Hatcher, Jan. 16, 1897.)

4. P. INTERRUPTUS Kitaibel.

With running rootstock often from a small tuber; branching fan-wise. *Leaves* linear, 10 cm. long, 2–2.5 mm. wide, 3–5-nerved and also transversely. Some plants with narrow 1-nerved leaves. *Stipules* adnate to leaves. *Peduncles* 25–50 mm. long. *Spikes* slightly interrupted. *Fruit* obliquely obovoid, keeled.

Eur. and N. Am., in ponds.

5. P. JUNCIFOLIUS Kerner.

In N. Fuegia (P. Dusén).

6. P. LINGUATUS Hagstr. n. s.

Stem rigid, emitting near the floral leaves a spiciferous branch with coriaceous leaves. Internodes equal in length, 4–5 cm. Submerged *leaves* thin, entire, lanceolate-lingulate, obtuse, the lateral principal nerves connected with the midnerve half way up. Floating leaves coriaceous, oval-subcordate, petiolate, with persisting, 2-costate stipules. *Peduncle* 7–10 cm.; spike 3 cm. *Fruit* dorsally carinate when dry and apically subrostrate.

S. Patagon.

Caulis 30–50 cm. altus, rigidus, teres vel subteres, 3–7 mm. crassus, ad folia floralia ramum spiniformem foliis vere coriaceis emittens, ceterum simplex vel vix ramosus; internodia fere æquilonga (4–5 cm.); folia submersa tenuia, integerrima, lanceolato-lingulata, obtusa, lamina 9–10 cm. longa et 2.5–3.5 lata, petiolo brevi (10–25 mm.), nervis lateralibus principalibus fere ad medium folii cum costa centrali connexis; folia floralia longe petiolata (8 cm.), ovalia, vix coriacea; folia natantia coriacea, obtusa, ovali-subcordata, longe petiolata, lamina c. 8 cm. longa et 3.5 cm. lata; stipulæ 4–6 cm. longæ, persistentes, bicostatæ, costis validis, ad basin stipularum valde prominentibus (costa crassitudinem stipulæ 3–4plo superans); pedunculus 7 cm. longus; spica mediocris, 3 cm. longa; stigma parvum, ovale (ut videtur); fructus 3.5 mm. longus et 2 mm. latus, apicem versus in parte dorsali siccus, conspicue carinatus, lateribus convexis, apice inconspicue rostrato.

Hab. Patagonia australis, Kark. (30/3, 1899).

7. P. NATANS Linn.

Floating leaves on long stalks, ovate-elliptical, many-nerved, cusp-pointed, basi-cordate. Submerged leaves reduced to bladeless petioles. *Stipules* long. *Spikes* cylindrical; *achenes* large, 4.5 by 2.5 mm., pitted on the sides, grooved on the back.

(Temperate N. Am. and Eur.; Chili); W. Patagon. and E. Fueg. (P. Dusén).

8. P. PECTINATUS Linn.

Leaves all submerged, setaceous, alternate upwards, 1-nerved; *stipules* half adnate, scarious-margined; *peduncles* filiform; flowers verticillate; *stigma* capitate on a short style. *Fruit* obliquely obovoid, scarcely keeled.

(N. Am. and Eur.; Cuba; Andes); S. Patagon. (Hatcher).

9. P. PUSILLUS Linn.

Stem compressed-terete, very slender, branching. *Leaves* all submerged, linear, 3-nerved, alternate or opposite, sheathing at the base; *stipules* connate, distinct from leaf, with a gland at their base. *Spike* stalked, slender, interrupted, 3–10-flowered. *Peduncle* 2–3 times longer. (Eur.; N. Am.); S. Patagon., by Gregory Bay; Fuegia.

Family 7. JUNCAGINACEÆ. Arrow-grass Family.

Marsh-herbs with glabrous narrow rush-like radical *leaves*, sheathed at base, and small inconspicuous 6- or 4-merous *flowers* in a spike or a raceme. *Perianth* 2-seriate. *Stamens* 6 or 4, hypogynous, the anthers extrorse, subsessile. *Carpels* 3–6, 1–2-ovuled, more or less united. *Embryo* straight; endosperm none. (Ovules solitary in the Patagonian forms.)

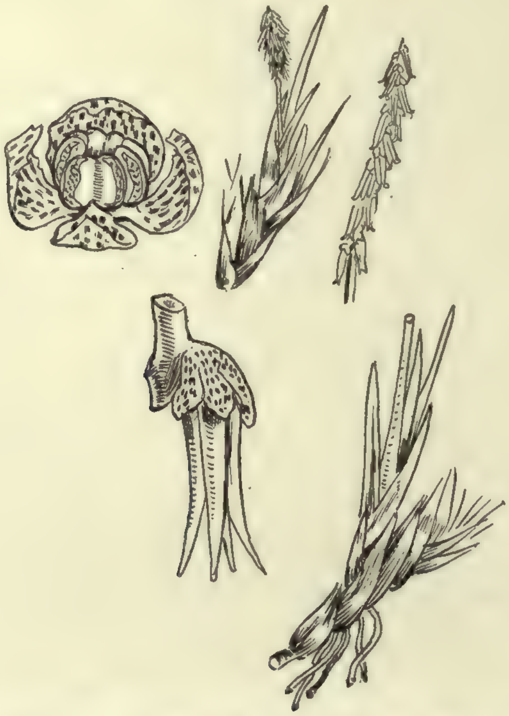
KEY TO THE GENERA.

1. Flowers 4-merous.	*Tetroncium.*
2. Flowers 6-merous.	*Triglochin.*
3. Flowers 1-merous. Chilian Andes.	*Lilæa.*

1. TETRONCIUM Willd.

Flowers 4-merous, diœcious. *Styles* distinct. *Staminate* flowers with

FIG. 29.



Tetroncium magellanicum. Herbage (below, to right); flower and floral spike; fruit and fruiting spike. (After *Flora Antarctica.*)

the perianth-leaves colored, concave, unequal, broad-ovate; stamens inserted on their base. *Pistillate* flowers with narrower perianth-leaves. *Carpels* 4, united at base, separating above; each 1-ovulate, but only 1 seed maturing.

Only species:

T. MAGELLANICUM Willd.

Fruits directed downward on the spike. Habit of *Triglochin maritima*.

Magellan (Dusén); Fuegia to Cape Horn; Falklands. (Fig. 29.)

2. TRIGLOCHIN Linn.

Marsh-herbs with ligulate *leaves*, and 6-merous hermaphrodite *flowers* racemed on a long naked scape. *Fruits* of 3–6 carpels, at length separating from the axis, opening ventrally. (Fig. in Eng. & Pr. ii, 1, 224. A-H.)

Species 9, in temperate and cold regions.

1. T. MARITIMA Linn. Seaside Arrow-grass.

Caudex thick, sheathed by old leaves. *Scape* stout, 15–20 cm. high. *Leaves* semi-cylindric, 3 mm. wide. *Raceme* to 30 cm. long, crowded with flowers on short ascending pedicels. *Fruit* ovoid, with recurved styles.

In the cold and temperate parts of the northern hemisphere, in saline and maritime marshes. In the southern hemisphere known only at Magellan, and Brecknock Pass, and by Rio Deseado.

2. T. MICROPHYLLA Phil.

Fruits irregularly and broadly winged; but the wings not entire as in *T. alata*.

Patagonia.

3. T. PALUSTRIS Linn.

Leaves linear, long-pointed, shorter than the scapes. *Racemes* 12–30 cm. long, pedicels capillary. *Fruit* linear, tapering basewards, of 3 united carpels. Stigmas sessile.

(Eurasia; N. of N. Amer.); S. Patagon., by Rio Sta. Cruz, Magellan, and Gregory Bay; Fuegia.

4. T. STRIATA Ruiz & Pavon.

Rhizome stoloniferous. *Leaves* linear, semi-cylindric, almost equalling the scape. *Raceme* many-flowered, flowers brevi-pedicillate, erect-spreading. Inner stamens often abortive. *Fruit* globose; carpels of ripe fruit 3.

T. STRIATA FILIFOLIA.

Rarely exceeding 25 cm. high, the *leaves* narrowly linear or filiform, often longer than the scape. Sir Joseph Hooker says (Flor. Antarct. ii, 360) that it greatly varies in size, the scape sometimes exceeding, sometimes being shorter than the leaves.

T. STRIATA HUMILIS.

Scape 1-flowered, shorter than the leaves. Fruit ovoid, of 6 carpels. *Leaves* linear to filiform.

(Found in New Zeal., Tasmania, Australia, Auckland I., Chili, S. Brazil, Argentina, Peru, and thence northwards to the S. United States; also in South Africa.) At Rio Coy, S. Patagon. by O. A. Peterson, Dec. 17, 1896. (This has leaves shorter than the scape, pedicels 4 mm., fruit 3 mm.)

Family 8. ALISMACEÆ. Water-plantains.

Aquatic or marsh herbs, usually glabrous, with fibrous roots, scapose stems, sheathed by basal, long-petioled leaves. Flowers racemed or panicled, regular, with whorled pedicels subtended by bracts. Sepals 3; petals 3, larger, imbricated. Stamens 6 or more. Carpels superior, mostly numerous and separate, 1-celled, usually 1-seeded. Seeds and embryo curved. No endosperm.

Species 70, cosmopolitan by fresh water.

1. ECHINODORUS Rich.

Each floral verticil with 3 outer bracts and many inner bracteoles. Petals white; receptacle large, subglobose. Stamens 12–30. Achenes ribbed and beaked, forming spinose heads.

Species 14, mostly American.

1. E. GRANDIFLORUS (Cham. & Schl. sub *Alisma*) Michel.

Leaves cordate, obtuse. *Raceme* simple or compound, many-flowered. *Petals* twice as long as the calyx. *Style* uncinate.

(S. Brazil); frequent near Rio Negro, by Carmen de Patagones.

2. E. PATAGONICUS Speg.

Striate leaved, simply-scaped, subdecandrous, low. *Leaves* membranaceous, ovate-cordate or subhastate, with obtuse lobes and apex, 5–7-nerved. *Scapes* trigonous, exceeding the leaves, bearing 2–3 verticils with 3–6 flowers in each verticil; pedicels long; flowers small; *stamens* erect, flavescent. *Carpels* very many and small, dimidiate-obovate, laterally compressed and nervose, with a long gland between the nerves. *Style* subterete, as long as the carpel.

N. Patagon., Neuquen near Fort Roca.

2. SAGITTARIA Linn. Arrowhead.

Perennials with nodose rootstocks, the leaves long-petioled, nerved and with cross-veins, or reduced to bladeless phyllodes. Flowers monœcious or diœcious, the staminate usually uppermost in the panicle. Verticils 3-flowered, 3-bracted. Petals white. Achenes in globose heads. Leaves often arrow-shaped.

Species 30, in temperate and warm climates.

S. MONTEVIËDENSIS Cham. & Schlecht.

Leaves sagittate, rough on the margin and on the nerves and veins of the under surface. Anthers linear, yellow. Filaments longer than the anthers, subulate, hirt.

(S. Brazil); N. Patagon.; common near Rio Negro by Carmen.

Family 9. VALLISNERIACEÆ. Tape-grass.

Submerged and floating long grass-like herbs, with regular diœcious flowers appearing above a 3-leaved remote spathe. Inner perianth petaloid. Ovary 1-locular, with 3 parietal placentæ. Fruit ripening under water, indehiscent. Seeds numerous.

VALLISNERIA Linn.

Floating in quiet streams. Staminate flowers minute, many in the spathe, on a short scape early separating and floating freely on the surface of the water. Pistillate flowers solitary on a very long spirally twisted scape, the perianth-tube adnate to the ovary, with three small petals. The scape by unrolling elevates the pistillate flowers to the surface, where they are hydrophilously fertilized. They are then submerged again and ripened under water. Fruit long-cylindric, crowned by the perianth.

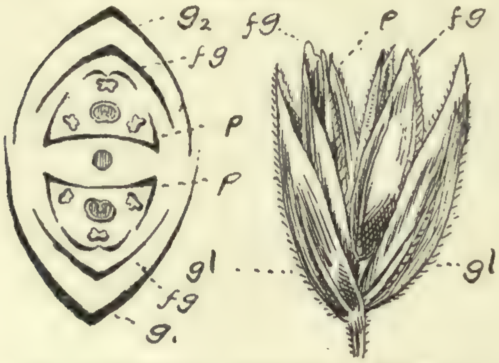
V. spiralis Linn.

In the warmer parts of both worlds, and in temperate North America. In a brook by Rio Chico de Sta. Cruz, Patagon. (J. B. Hatcher, the young plants on March 27, 1897).

Family 10. Gramineæ. The Grasses.

Herbs (or rarely in the tropics woody plants), with terete hollow *stems* and *nodes* solid (the whole stem is solid in a few), and with narrow 2-ranked parallel-veined *leaves*, sheathing at their base and the *sheaths* split in front and liguliferous at their top.

Fig. 30.



Poa kerguelensis. Spikelet and its diagram. *gl, g,* glumes; *fg,* floral glumes; *p, p,* paleæ.

Flowers glumaceous and collected in *spikelets*, each having 1–several flowers. The spikelets arranged in compound inflorescences, as racemes, or spikes, or condensed or lax panicles.

Analysis of a spikelet, proceeding from below upward (Fig. 30):

(1) General part, for the whole spikelet: *Glumes*, 1, 2, or 3; mostly 2, equal or unequal: often called "empty glumes"; here mostly called simply "the *glumes*."

(2) Particular part, belonging to the individual flowers:

Palets or glumelles, normally 2 for each flower, viz.

(*a*) the outer or lower palet, often awn-bearing, and commonly termed the "flowering-glume" or "floral glume," which may be conveniently transformed into the single term, *floriglume.*

(*b*) the upper or *inner palet:* it is usually thinner than the preceding, is 2-keeled, not awned; and is usually next the axis, rachilla, of the spikelet. We may call it the *palea.* *Callus* or *anthopodium* is an enlargement of the rachilla below the flowering glume.[1]

Also (*c*) *Lodicules*, 1, 2, or 3 minute '*scales*,' enclosed by the palets, placed either anteriorly, or laterally, or posteriorly.

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[1] The German terms are: (spikelet) ährchen; (empty glume) hüllspelze; (floriglume) deckspelze; (palea) vorspelze.

(*d*) *Stamens* 1–many; mostly 3 (the outer series of a double group, 1 being anterior and 2 postero-lateral).

(*e*) The *ovary*, 1-ovuled with inferior external *embryo* ventrad of the large floury endosperm; 2 stigmas, right and left; ripening to a grain (caryopsis).

The term "flower" is used to include one set of the palets and the parts which they enclose.

(3) Above the flowers in a spikelet and occasionally below them may be 1 or more rudimentary flowers with palets and inner organs variously reduced.

(4) In a few genera the whole spikelet is 1-sexual, and the whole plant may be diœcious.

Species about 3,500, growing in all lands; the most useful of the plant-families. [Note (1) the foliage, including the leaf-sheaths, ligules and glabrescence or pubescence; (2) the inflorescence; (3) the parts of a spikelet, and the number of its normal and rudimentary flowers. When not otherwise stated in our descriptions the stamens may be assumed to be 3, and the styles 2 with feathery stigmas.]

KEY TO THE TRIBES AND GENERA.

A. Spikelets 1-flowered, without prolongation of the axis: rarely with an imperfect lower flower. Not flattened laterally. No internode between flowers or glumes. (ANDROPOGONEÆ.)
  b. Spikelets awnless, on a jointed rachis, easily breaking; silky. 1. *Elionurus*, p. 160.
  b2. Spikelets in pairs on a jointed hairy, not thickened rachis. One of a pair perfect and sessile, the other pediceled and male. Each 1-flowered, with 4 glumes; the lowest glume coriaceous, the uppermost (floral) usually awned. 2. *Andropogon*, p. 160.
  b3. As *Andropogon*, but spikelets both hermaphrodite.
    c. Spike-like panicle woolly. Palea nerveless. Awnless. 3. *Imperata*, p. 161.
    c2. Spike slender with jointed, excavated rachis. Rachilla awn-like: palea 2-nerved. 56. *Lepturus*, p. 245.
  b4. Spikelets all hermaphrodite, mostly glabrous, separating individually from the pedicel. Glumes 3–4, the floral not awned, more or less coriaceous. (PANICEÆ.)
    c. Spikelets without sterile valves or bristles or spines.
      d. Glumes 3; no callus in the spikelets.
        e. Racemed or spiked; the spikes 1-sided, in 2's or panicled. 4. *Paspalum*, p. 162.
        e2. Panicled. 5. *Anthænantia*, p. 163.
      d2. Glumes 4 (or the lowest one obsolete); spikelets single, pediceled. Lowest glume short; third empty or male; fourth floral. Panicle either lax or spike-like. 6. *Panicum*, p. 163.
    c2. Spikelets with involucres of persistent bristles or spines.

d. Bristles persisting after the fall of the spikelets.
7. *Setaria* (*Ixophorus*), p. 164.

d2. Spines forming a bur; falling away with the spikelets.
8. *Cenchrus*, p. 165.

A2. Spikelets 1-flowered, monœcious. Aquatic or marsh-grasses, stamens 6 or more. (ORYZEAE.)

b. Creeping; male and female flowers in separate panicles. 9. *Luziola*, p. 165.

b2. Tall, male and female flowers in the same panicle, the females terminal.
10. *Zizaniopsis*, p. 166.

A3. Spikelets 1–many-flowered. When 1-flowered, often with prolonged axis; this is jointed above the empty glumes and persists after the fall of the floral glume and flower. When 2-flowered there is an internode between the flowers.

B. Culm herbaceous, annual. Leaf-blade continuous with (not articulated on) the leaf-sheath and not petioled.

C. Spikelets on pedicels, in lax or spike-like panicles, or in racemes. Rachis not thickened and excavated.

D. Spikelets 1-flowered.

e. Glumes 5, the fifth floral. Palea 1-nerved. (PHALARIDEÆ.)

f. First glume shorter than second. Third and fourth still shorter, awned dorsally, empty. Stamens 2. 11. *Anthoxanthum*, p. 166.

f2. Glumes 1 and 2 subequal, 3 and 4 nearly as long, often with a male flower, awnless or shortly awned. Stamens in the hermaphrodite flowers 2.
12. *Hierochloë* (*Savastana*), p. 166.

f3. Glumes 3 and 4 small and empty, awnless. Stamens 3.
13. *Phalaris*, p. 167.

e2. Empty glumes only 2 (rarely none), equalling or exceeding the floral glume. Palea 2-nerved, grain not grooved. Spikelets stalked. (AGROSTIDEÆ).

f. Floral glume hard and close about the ripe grain. Spikelets all fertile.

g. Floral glume entire; its awn 3-parted. 14. *Aristida*, p. 168.

g2. Floral glume entire; its awn simple.

h. Lodicules mostly 3. Floral glume and palea becoming hard. Awn long, twisted, persisting. 15. *Stipa*, p. 168.

h2. As *Stipa*, but floral glume broad, and its awn very caducous. Cespitose, sometimes tall. 16. *Oryzopsis*, p. 177.

h3. Lodicules 2, the anterior pair. Spikelet small, at most coriaceous. Awn short, or a mere mucro. 17. *Muhlenbergia*, p. 178.

f2. Floral glume not as hard as the empty glumes, loosely or not at all enclosing the ripe grain.

g. Stigma small, brush-like, protruding only slightly. Spikelets forming a dense or short quasi-spike, the uppermost not sheathed.

h. Empty glumes produced into awns, persisting on the axis. Floral glume much shorter, obtuse, awnless, mostly coming away.
18. *Phleum*, p. 178.

h2. Spikelets when ripe easily separating as a whole. Lower pair of glumes more or less united; third or floral glume dorsally awned.
19. *Alopecurus*, p. 179.

g2. Stigmas long, feathery, protruding, rarely remaining enclosed.

h. Fruit stripped of the floral glume and palea; mostly with splitting, loosely attached pericarp. 20. *Sporobolus*, p. 180.

h2. Fruit enclosed in the floral glume and palea, with adhering pericarp.

i. Spikelet at length falling away as a whole, often leaving the stump of its jointed pedicel. Empty glumes 2, awned; floral glume smaller, with a short awn. 21. *Polypogon*, p. 181.

i2. Spikelet leaving the empty glume persisting on the unsegmented hairy pedicel. Panicle mostly lax.

j. Empty glumes exceeding the usually awned floral glume. No prolongation of the rachilla above the palea. Callus bare. 22. *Agrostis*, p. 182.

j2. Rachilla or callus with a hairy tuft prolonged above the palea. Floral glume dorsally awned, hairy. Spikelets all hermaphrodite. 23. *Calamagrostis*, p. 192.

D2. Spikelets 2–many-flowered.

e. Floral glume usually shorter than the empty glumes. Awn dorsal, bent, rarely apical or none, and then with 2 opposite flowers and the rachilla not prolonged. (AVENEÆ.)

f. Spikelets easily deciduous as a whole, 2-flowered, upper flower staminate, with a recurved awn. 24. *Holcus*, p. 196.

f2. Fruiting spikelets separating from the persisting empty glumes.

g. Spikelets always 2-flowered, without prolongation of the axis.

h. Empty glumes coriaceous, broad, many-nerved. Floral glumes long-ciliated. Paleæ naked. 25. *Eriachne*, p. 197.

h2. Both floral glumes and paleæ naked. Flowers close together, equal, perfect. Panicle lax.

i. Empty glume semicircular, and spikelet globular, awnless. 26. *Airopsis*, p. 197.

i2. Empty glumes thin, acute. Flower glumes awned, 2-toothed. 27. *Aira*, p. 197.

g2. Spikelets 2–several-flowered, with the axis prolonged above the second flower.

h. Floral glumes toothed and dorsally awned. Upper flower sometimes sterile. Inflorescence not a true spike.

i. Fruit free, not grooved. Spikelets small, not 1 cm. long.

j. Floral glume finely erose-dentate or 2-lobed. 28. *Deschampsia*, p. 199.

j2. Floral glume cleft or 2-toothed, or the teeth awned, besides the dorsal awn. 29. *Trisetum*, p. 203.

i2. Fruit grooved, mostly adhering to the palea. Paniculate. Spikelet exceeding 1 cm. long. Grain apically hairy. 30. *Avena*, p. 206.

h2. Awn generally twisted and arising between the lobes (often awned) or teeth of the floral glume. Spikelets 3–many-flowered, uppermost flower sometimes imperfect. 31. *Danthonia*, p. 207.

*e*2. Floral glume usually exceeding the empty glumes; not awned or awned only from the point and the awn not bent. (FESTUCEÆ.)

f. Floriglume surrounded by long hairs. Lower flower male or abortive. Tall aquatic. 39. *Phragmites*, p. 212.

*f*2. Floriglume dividing into awn-like parts. Panicle spike-like. 38. *Pappophorum*, p. 211.

*f*3. Spikelets unisexual. Creeping with minute, distichously crowded leaves. 40. *Monanthochloë*, p. 212.

*f*4. Axis of spikelet or floral glume with long hairs (at least in the fertile flowers). Tall, tubular grasses. 41. *Gynerium* = *Cortaderia*, p. 213.

*f*5. Axis and floral glumes naked or with only short hairs. Stigmas feathery. Spikelets all alike.

g. Floral glume 2–3-toothed, usually 3-nerved; lateral nerve and callus usually hairy. Spikelets with 3–several fertile flowers and 2 empty glumes. 42. *Sieglingia* = *Triodia*, p. 214.

*g*2. Floral glumes 1–3-nerved, all with perfect flowers or the uppermost male or empty.

h. Branches or panicles spirally arranged.

i. These branches being spike-formed racemes with subsessile spikelets. Floral glumes carinate. 43. *Diplachne*, p. 214.

*i*2. The branches again branching, shorter upwards. Spikelets dense, many-flowered, with a strong axis. 44. *Eragrostis*, p. 215.

*h*2. Primary branches of panicle distichously arranged (branching further at base).

i. Panicle spike-like. Empty glumes not broader nor longer than the floral glumes. 45. *Koeleria*, p. 216.

*i*2. Panicle expanded with soft, long branches. Empty glumes slightly unequal. 46. *Catabrosa*, p. 216.

*g*3. Floral glume 3–5-many-nerved, all with perfect flowers, or the uppermost male or empty, appressed or embracing. Empty glumes mostly clavate, not awned; floral glumes sometimes awned. 47. *Melica*, p. 217.

*g*4. Floral glumes 5–many-nerved, all or all but the uppermost with perfect flowers, often several empty glumes at top. Leaves without distinct cross-veins.

h. Plant diœcious. Spikelets sessile. 48. *Distichlis*, p. 217.

*h*2. Plant hermaphrodite (very rarely diœcious, and then laxly-paniculate).

i. Floral-glumes cordately lobed at the base. 49. *Briza*, p. 218.

*i*2. Floral glumes not basi-cordate.

j. Spikelets panicled or racemed, imbricating or glomerulate. Panicle-branches 1–5.

k. Stigmas 2, apical. Floral glumes, at least of the upper flowers, protruding above the empty glumes.

l. Lateral nerves of floral glumes subparallel, not converging. Empty glumes shorter than the floral.

m. Style developed. Lodicules connate.

50. *Panicularia* (*Glyceria*), p. 219.

m2. Stigma sessile. Lodicules free.

51. *Atropis* p. 220.

l2. Lateral nerves of floral glume arched, converging towards apex. Rachilla naked or downy or hairy.

m. Empty glumes carinate. Hilum punctiform. Floral glume coriaceous at base or herbaceous and webbed. 52. *Poa*, p. 221.

m2. Empty glumes rounded on back. Hilum lineal. Palea rough or ciliate on the keel.

53. *Festuca*, p. 231.

k2. Stigmas 2, arising subapically, on the anterior face of the ovary. Empty glumes awnless.

54. *Bromus*, p. 240.

C2. Spikelets in 2 rows beside each other, forming a 1-sided spike or raceme, with unarticulated rachis; all the spikelets hermaphrodite in the Patagonian species. (CHLORIDEÆ.)

d. Only 1 hermaphrodite flower in each spikelet (very rarely 2).

e. No empty glumes or male flowers. Only rarely a short pedicel extends above the flower. No awns. Spikelets fall off as a whole.

32. *Spartina*, p. 208.

e2. Spikes digitately arranged. Spikelets not falling off.

33. *Capriola*, p. 209.

e3. Empty glumes 1–several, above the hermaphrodite flower; often small or awn-like, rarely enclosing a male flower. Lower empty glumes 2. Spikelets 2–many, often like small fascicles.

f. Spikelets quasi-verticillate, or close together. Floral glume of the perfect flower 1-awned or awnless. 34. *Chloris*, p. 209.

f2. Spikelets 1-, rarely 2-flowered, sessile on subverticillate spikes. Upper empty glume awned, and floriglume 3-awned. Rachilla produced and variously glumiferous. 35. *Trichloris*, p. 210.

f3. Spikelets remote, or approximate below; the flowers close. Paleæ not hairy. 36. *Bouteloua*, p. 211.

d2. Every spikelet having 2–3 hermaphrodite flowers. Spikes 1–3 at apex of culm, erect. Floral glume with 1 awn between 2 obtuse apical lobes.

37. *Tetrapogon*, p. 211.

C3. Spikelets in 2, rarely more, opposing rows on a zigzag axis, forming a symmetrical, rarely a 1-sided spike. (HORDEÆ.)

d. Spikelets solitary in the excavations of the rachis.

e. Spikelets many-flowered, median on the rachis (the dorsal aspect of the glumes being towards the rachis). Glumes subulate, 1-nerved.

55. *Lolium*, p. 244.

e2. Spikelets 1–2-flowered (sides of glumes toward the rachis; in slender articulate spikes). 56. *Lepturus*, p. 245.

*e*3. Spikelets 2–many-flowered, placed sidewise on the axis, mostly in thick spikes, the joints usually not coming apart. Glumes ovate, 3–many-nerved. Floral glume with a callus, falling away when ripe along with a single grain attached to the palea. 57. *Agropyron*, p. 245.

*d*2. Spikelets 2–6 on every segment of the rachis. Stamens 3.

e. Spikelets 1-flowered, with at most the rudiment of a second. 58. *Hordeum*, p. 248.

*e*2. Spikelets 2–many-flowered. Empty glume slightly smaller than the floral. 59. *Elymus*, p. 252.

*B*2. Culm woody at least at base. Leaves often with short petiole, jointed to the sheath. (BAMBUSEÆ.)

Section with 3 stamens; paleæ 2-keeled. Fruit without a soft pericarp. Spikelets 1-flowered, panicled. 60. *Chusquea*, p. 255.

1. ELIONURUS Humb. & Bonpl.

Andropogoneæ, with 1-flowered awnless *spikelets*, some sessile, some pediceled. *Rachis* jointed, easily breaking into segments, the 2-pointed lower *glume* strongly fragrant when fresh or wet, having a balsamiferous gland.

Species 15, chiefly in warm parts of America, and some in Africa, the Orient and Australia. Savanna-grasses, avoided by cattle; the scent seeming to deter them.

E. CANDIDUS (Trin.) Hack.

Leaves filiform, below generally piliferous. *Ligule* composed of long hairs. *Spikes* (7–10 cm.); pedicel of acute male spikelet, and inferior glume of both spikelets white-silky villous. Perennial grass.

(Brazil); N. Patagon., in sandy meadows by Carmen de Patagones, and Bahia de S. Blas. The Patagonian specimens differ from the description by the pilosity of the culms below the nodes, and of the outside of the leaves, which are subtrigonal in section, and with 3 larger nerves, and in the absence of balsam-glands.

2. ANDROPOGON Linn. Beard-grass.

Spikes terminal and axillary, having a jointed hairy axis, with spikelets in pairs at each node, one of each pair being sessile and perfect, the other pedicellate and staminate or rudimentary. Perfect spikelet with 4 *glumes*, of which the uppermost (the flowering glume) is awned and subtends a palea with a perfect flower. (Britt. & Br. i, 100.)

1. A. CONSANGUINEUS Knth.

Culms slender, about 25 cm. high, branching. *Leaves* to 10 cm. long by 1.5–2 mm., rough margined. Spathes 4 cm. long. Racemes lax, subsimple, 6–8-jointed, bearded at the base, with trilobulate appendage. *Spikelets* sessile, rufescent. *Glumes* 1 and 2 with scabrid keels, glume 3 shorter, nerveless, split to near the base, as is the floriglume, no. 4, which has an awn 17 mm. long basally torted; glume 1 linear-subulate, with a bearded callus; glume 2 linear-lanceolate. *Palea* none. *Stamens* 2–3, one of them larger. Pedicels suberect, ciliate, 6–9 mm. long, equalling the joints.

(S. Brazil); N. Patagon., in rocky plains near Rio Colorado.

2. A. SACCHAROIDES Sw.

Culm erect, simple, terete (30–40 cm. high), nodes silky-bearded. *Leaves* linear, subvillous. Panicle compact, linear-oblong, its rays solitary or in pairs, simple or bifid, floriferous from base. *Joint* and pedicel of fading spikelet densely villous. *Awn* twice as long as its villous spikelet.

N. Patagon. (Roca Exped.); Brazil; W. Indies.

3. IMPERATA Cyr.

Perennial grasses of medium height with innovations of long leaves, short *culms*, and spike-like woolly *panicle*, creeping rhizome with scaly stolons. *Spikelets* in twos at the nodes, the primary long-, the secondary short-pediceled, all 1-flowered, hermaphrodite, linear, subcompressed, awnless. *Glumes* 4, of which 1 and 2 are membranaceous, convex; 3 is hyaline, empty; 4 is hyaline, rarely wanting: *palea* always present, broad, hyaline. nerveless, enclosing the *grain*. Lodicules none. Stamens 1–2.

Species 3–4, in tropics of both worlds.

I. ARUNDINACEA Cyr.

Culms about 1 meter high, of 3–4 nodes, glabrous, shortly naked above. *Sheaths* mostly longer than the internodes, at length becoming dry parallel fibers. *Spike-like panicle* 5–20 cm. long, racemes 1–2 cm., of 5–10 internodes. *Spikelets* 4–5 mm.; the villi from the callus 4–5 times as long,

I. ARUNDINACEA CONDENSATA (Steud.).

Nodes of sheath glabrous; ligule 2–3 mm., ovate, obtuse; laminæ of *leaves* sublanceolate-linear, attenuate to a long, slender point, not pungent, the lower 10–15 cm. long, smooth on both surfaces.

(Chili); Patagon., dry meadows near Colonia; Bolson.

4. PASPALUM Linn.

Panicle with 1-sided spikes, the spikes, with 2–4 rows of 1-flowered spikelets. *Glumes* 3, sometimes 2, the upper enclosing a shorter palea with the perfect flower. *Grain* free. (Britt. & Br. i, 105; Eng. & Pr. i, 2, 34, fig. 24.)

Species, chiefly American; many are pampas plants.

1. P. DILATATUM Poir.

Culm erect, glabrous, 60–90 cm. *Sheaths* compressed, the radical more or less villous; *ligule* membranaceous, obtuse or acute, pilose or naked. *Leaves* (sublanceolate-) linear, the radical more than 30 cm., 6 mm. broad. *Racemes* 2–10, scattered, alternately thick, often nutant, 4–10 cm. *Rachis* glabrous, rather narrow. *Spikelets* 4-seriate, sublinear, unequally pediceled, ovate, acute (depressed), marginally villosulous. *Glumes* 5-nerved. Perennial grass.

(S. Amer.); N. Patagon., along Rio Negro near Carmen, not rare in herbage.

2. P. DISTICHUM Linn.

Culms creeping. *Leaves* flat (2–4 mm. broad), acuminate, smooth. *Spikes* 2, Y-like, occasionally 3. *Spikelets* oval, acute.

N. Patagon. (Roca Exp.); N. and S. Amer.

3. P. ELONGATUM Gr.

Stout, erect, 1 m. high. *Leaves* 18 cm. long, linear-acuminate; sheath long, *ligule* very short, truncate, ciliose. *Panicle* long, with many alternate branches; its spikelets 4-seriate, elliptical, obtuse, unequally pedicelled, glabrous. Sterile *glumes* remote from the rachis, 3-nerved; *floral glume* 5-nerved.

N. Patagon. (Roca Exp.); Argentina.

4. P. LEUCOPHÆUM H.B.K.

Culm erect, tall, 60–180 cm., it and its nodes scabrous. *Leaves* linear, acuminate, scabrid both surfaces and margin (20–35 cm. by 4–8 mm. wide). *Sheaths* lax, from hairy tubercles; *ligule* short, rounded. *Racemes* numerous, dense, verticillate, subfastigiate. Pedicels short, or equalling the spikelet; this 4–6 mm., linear-lanceolate, densely woolly.

(S. Amer.); N. Patagon., in sandy meadows near salina at Carmen.

5. P. PUMILUM Nees.

Root densely fibrous, cespitiferous. *Culm* simple, ascending, paucinodal (15–25 cm.), filiform, glabrous. *Leaves* lax, glabrous to soft-villous; *ligule* very short; blades lance-linear (25–50 mm. long, 5 mm. broad), acute, plane, pubescent or villosulous. *Racemes* approximate in pairs. *Rachis* plane, narrower than the solitary spikelets; these 1.5 mm. long. *Glumes* orbiculate, elliptic, obtuse, glabrous, the lower 5-, the upper 3-nerved. Perennial.

(Brazil); N. Patagon., wet places by Rio Negro, near Carmen.

5. ANTHÆNANTIA Beauv. (R. & S. sub. *Milium.*)

Erect grasses with oblong, lax, more or less silky *panicles*, having filiform rays and pedicels. *Spikelets* articulating on the pedicels, having 3 *glumes*, the uppermost or floral glume, enclosing the palea and a hermaphrodite flower, the second slightly larger and empty, or having a male flower, the lowest glume the largest. *Grain* freely enclosed in the pergamentaceous glumes.

Species about 5, from California to Patagonia. (By O. Ktze. made a section under *Panicum.*)

A. LANATA Benth. (*Panicum insulare lachnanthum* O. Ktze.)

Culm erect. Leaves subinvolute or pilose on upper surface, the lower sheaths villous. *Panicle* jubate, its rays whorled. *Spikelets* acute, 3 mm. long. Lowest *glume* 5–7-nerved, villous-woolly, acute, exceeding the flower. "Border of third valve, and whole of second valve glandular-hairy; small first valve under the third, naked."

(Surinam, Brazil); N. Patagon.

6. PANICUM Linn.

Branches of panicle either simple or again divided. Pedicels jointed under the spikelets. The spikelets 1–2-flowered, when 2-flowered the lower is staminate only. Glumes 4, the lowest awnless and very small. Thus there are three empty glumes, or two empty glumes with a staminate flower in the third. Grain free, in a hardened fruiting scale. (Brit. & Br. i, 2, 113.)

Species 300, cosmopolitan in warm climates; few in Chili.

1. P. CHLOROLEUCUM Griseb.

Rush-like perennial, branching at the base, 30–40 cm. tall, ascending, glaucous-white, woolly at nodes and ligules. *Leaves* arcuate, as long as the culm, linear-acuminate, convolute, hairy. *Panicle* patent, 12 cm. long, its branches woolly, paired or solitary, racemiform or branched. Sterile *glumes* 3, equal, ovate, acute, 5–7-nerved, slightly exceeding the 5-angled compressed obtuse floral glume. N. Patagon. (Argentina).

(*P. lachnanthum* O. Ktze. (Torr.) = *Anthænantia lanàta* Benth.)

2. P. MAGELLANICUM Lam.

Spikes filiform, fasciculate. *Glumes* pediceled, oblong, acute, very slender.

Magellan.

3. P. URVILLEANUM Kth. (*P. patagonicum* Hier.)

Perennial with branching base, glaucous white, and ascending *culms*, 60 cm., hard, distichously leafy at base. *Nodes* glabrous or villous. *Leaf-sheaths* velvety, with reversed hairs, 15 cm. long, 1 cm. broad; *laminæ* 25–55 cm. by 4–5 mm., linear-acuminate, terete, not scabrid. *Ligule* densely villous. *Panicle* patent, with triquetrous alternate racemiform branches, sucessively long and short. *Spikelets* velvety, subsecund. *Sterile glumes* 3, ovate, hairy on back, the lowest 5–7-nerved, the second 13-nerved, the third 7–9-nerved, with a neutral flower. *Floral glume* 7-nerved, coriaceous.

(Chili; Argent.); N. Patagon., by Rio Negro and the coast.

7. SETARIA Beauv. (*Chamæaphis* R. Br., *Ixophorus* Schl.)

Annuals with spike-like *panicle*, awnless, but with awn-like branches projecting above the spikelets. *Glumes* 4; 1 small, 2 and 3 equal or 3 larger, all membranous; the third enclosing a male or neuter flower; the fourth, or flowering glume, enclosing the perfect terminal flower, is firm, and at length indurated along with the palea about the grain.

Species 35, in warm and temperate regions.

1. S. GLAUCA Beauv. Yellow Foxtail.

(*Ixophorus glaucus* in Brit. & Br. i, 126.)

30–60 cm. high. *Leaf-sheaths* smooth, loose, the lower compressed, reddish; *laminæ* flat, scabrous, twisted. *Spike* simple, cylindrical, tawny when mature, bristles pointing upward. *Floral glume* oval, coarsely rugose across.

(Eur. & N. Amer.); N. Patagon.

2. S. SETOSA Beauv. (*S. caudata* Roem. & Sch.)

60–90 cm. high. *Culm* slender, erect, flattened, branching below, nodes glabrous. *Leaves* scabrous, twisted, flat, blades to 20 cm. long, 4 mm. broad, apex long, slender. *Panicle* interrupted cylindrical, 18 cm. by 7 mm., its axis pilose; bristles 1–3 to each spikelet, 3–10 mm. long, pointing upwards. *Spikelets* 3 mm. long; first glume broad, 3-nerved; second and third glumes equal, a neutral flower in the third; which is 7-nerved. *Palea* small. *Floral glume* wrinkled across.

(Tropical regions, New Mex. and south.) Common in North Patagonia.

8. CENCHRUS Linn. Bur-grass.

Leaves flat. *Inflorescence* spicate, the spikelets subtended by a spiny involucre which at length falls off with the seed as a spiny bur. *Glumes* 4, the third often enclosing a staminate, and the fourth being the flowering glume of the perfect flower.

Species 12, in warm countries.

C. TRIBULOIDES LINN.

Root annual. Involucres crowded on the scabrous rachis, 2-flowered, globose. Spines of burs stout. (N. Amer., Br. & Br. i, 127.)

N. Patagon.

9. LUZIOLA Juss.

Creeping water and marsh monœcious grasses with narrow leaves, and male and female 1-flowered *spikelets* in separate panicles, rarely in the same and then the male spikelets terminal. Rays of panicle filiform. *Stamens* exceeding 6 (to 18). Female flowers small. *Styles* 2, distinct. *Grain* elliptical, free from the pericarp.

Species 6, Brazil to Alabama; 1 in Patagonia.

L. SPRUCEANA Benth.

Culm glabrous, rooting at the nodes; the upper leaf-sheaths ventricose, striate; ligule long-acuminate; lamina linear, narrowly acuminate, nervose, scabrous. Female panicle axillary, short-peduncled, rigid, its axis sulcate, angular, its branches crowded, strict, at length basi-refracted. Branchlets erect; no terminal spikelet. Male panicle patulous, after flowering contracted. Glumes pellucid.

(S. Brazil); Chubut, wet places.

10. ZIZANIOPSIS Döll and Ascherson.

Tall, aquatic, monœcious grasses with long flat leaves, and 1-flowered *spikelets* in panicles, the *female* terminating the branches, and the *males* below. Scales 2, subequal, the outer one in the female spikelet broad, acute, awned. Stamens 6. Styles united. *Grain* subglobose, separable from the pericarp, 3-ridged. (Fig. in Brit. & Br. i, 128.)

Temperate and tropical America. Species 2. (*Z. miliacea* in U. S. and Brazil.)

Z. BONARIENSIS (Bal.) Speg.

(Buenos Aires); N. Patagon., in wet places along Rio Colorado.

11. ANTHOXANTHUM Linn. Sweet-scented Vernal Grass.

Fragrant grasses with flat leaves and spike-like panicles. *Spikelets* 1-flowered, narrow, compressed. *Glumes* 5, the two lowest acute or short-awned, the lowest one the shortest; the third and fourth empty, hairy, 2-lobed and awned dorsally; the floral glume and palea small and obtuse. *Stamens* 2.

Species 5, European.

A. ODORATUM Linn.

Glumes 3 and 4 hairy, the third with an awn twice its length, inserted half-way up; the fourth with an awn inserted near the base and twice as long.

(Europe, naturalized in N. Amer., Brit. &. Br. i, 131.) Magellan (Dusén).

12. HIEROCHLOË Gmelin. (*Savastana* Schrank.)

Aromatic grasses with contracted or open panicles and flat *leaves*. *Spikelets* 3-flowered, the terminal flower perfect, the others staminate. *Glumes* 5, the 2 lower subequal, acute, glabrous, the next 2 shorter, obtuse or 2-lobed, each enclosing a palea and 3 *stamens;* the fifth often awned, enclosing a palea and a perfect 2-staminate flower.

Species 8, in temperate and cold regions. *H. borealis* Roem. & Schultes is the holy-grass of N. Eur. and N. Amer. (Brit. & Br. i, 131).

1. H. ARENARIA Steud.

Rhizome woody, somewhat creeping. *Culm* erect, 45–60 cm. high, sheathed the whole way; *sheaths* dilated; *leaf-blades* soon convolute, rigid, obtuse, glabrous. *Panicle* slightly diffuse, its rays solitary, few-flowered at top. *Spikelets* 6 mm. long, 3-flowered. *Glumes* slightly exceeding the flowers, those of the male flowers smooth marginally, ciliate, short, awned. *Perfect flower* obtuse, glabrous.

Magellan.

2. H. REDOLENS (Forst. sub *Holcus*) R. Br. (*H. antarctica* R. Br. *H. magellanica* Hook. f.)

Leaves plane below, convolute above, their sheaths lax-glabrous. *Panicle* effuse, nodding; pedicels pilose upwards. *Spikelets* 8 mm. long, the *male* flowers pilose on the margin and back; *perfect* flower short mucronate, glabrous.

Falklands, abounding near water; Magellan and through Fuegia to Cape Horn (also in S. Chili, Australia and New Zealand.)

H. REDOLENS MAGELLANICA (Hook. f.).

Panicle less elongate, and only slightly nodding.

Magellan.

H. REDOLENS MAJOR (Speg.).

Culms 2–3 meters, glabrous; ligules broadly triangular. *Panicle* very long, secund, nodding; upper rays close, lower remote.

Fuegia, by the coast; Blossom Bay; rare.

It would appear from Bentham's note in *Flora Austral.* vii, 558, that this species should be named *H. redolens* (Forster), as Forster's name (*Holcus redolens*) is the oldest and was applied to the typical New Zealand plant. It is *Melica magellanica* Desv. in Lam. Dic. iv, 72.

13. PHALARIS Linn.

Leaves flat; *panicle* spike-like or capitate. *Spikelets* crowded, 1-flowered. Empty *glumes* 4, first and second subequal, compressed, wing keeled; third and fourth small or rudimentary. Floriglume and palea equal. *Stamens* 3. *Styles* distinct. *Grain* oblong.

Species 10, most in S. Eur.; some in N. Amer.

P. ANGUSTA Nees.

Root fibrous. *Culm* (45–90 cm. high) and sheaths glabrous; the *sheaths* half as long as the internode. *Ligules* obtuse. *Leaves* glabrous, the upper 25 mm., the lower 7–10 cm. *Thyrse* 4–7 cm., linear. *Glumes* 3-nerved, subequally winged. Pedicels very short. Cartilaginous rudiments 2, pilose at apex, with pilose horn. *Flower* hermaphrodite, slightly shorter than the glumes, pilose.

S. Patagon., in meadows along Carren-leofú.

The Patagonia forms are stout, very green, with cylindraceous spikes, spikelets sometimes partly violascent. (Speg.)

14. ARISTIDA Linn. Three-awned grass.

Culms branching and *leaves* narrow, often involute-setaceous. *Panicle* spreading or contracted. *Spikelets* narrow, 1-flowered. *Glumes* 3, 1 and 2 carinate, third ridged and convolute, 3-awned (or the lateral awns obsolete). *Grain* free, enclosed in the glume.

Species 100, in warm countries. (Brit. & Br. i, 133.)

1. A. DIFFUSA Trin. & Rupr. (*A. laxa* Cav.)

Culms fasciculate, simple, 15–60 cm. tall. *Leaves* convolute, subulate, *sheaths* striate, glabrous. *Panicle* lax, depauperate, flexuose, its rays solitary, naked below, with spikelets above. *Glumes* fuscous, subequal, narrow, acuminate. *Flower* about 6 mm. long, apically twisted, lateral *awns* about thrice as long as the median.

Mexico, S. Amer. and Philippine Is. (In Patagon.?)

2. A. SETIFOLIA H. B. & K.

A tufted perennial about 60 cm. high. *Leaf-sheaths* short, lower *leaf-blades* numerous, narrow, involute. *Panicle* contracted, often included at the base. *Awns* of flowering glume diverging, mostly equal.

(Mexico and Brazil.) Probably in N. Patagon.

15. STIPA Linn. Feather-grass.

Tall, usually with convolute leaves which mostly persist around the fruit. Panicles with 1-flowered terete spikelets. Empty glumes 2, the floral glume rigid convolute, having a hairy, often sharp, callus at its base, and a bent apical awn which is spirally twisted below and articulated. Stamens mostly 3. Grain free, closely surrounded by the glume. (Brit. & Br. i, 137; also Spegazzini, *Stipeæ platenses.*) (Fig. 31.)

Species 100, cosmopolitan.

The awn may be naked, or may have a *crown* around its base (Fig. 31, *A*), often surmounted by a *pappus* of villi or cilia (in section *Pappophora*), and there may be a *callus* beneath the grain (*A*, *C*). *S. capillata* (Engl. & Pr. Pflanzenf. II, 2, p. 46, fig. C–E) is the chief grass of the Russian steppes; its fruiting awn pierces the skin of sheep, sometimes killing them: similarly *S. spartea* Trin., the "porcupine-grass" of North America, and the grass of North Queensland which annoyed Captain Cook's seamen in 1770. In North Africa, *S. tenacissima*, called Esparto, Alfa, and "false horse-hair," is extensively exported, being used in southern Europe for plaiting into mats and chairs.

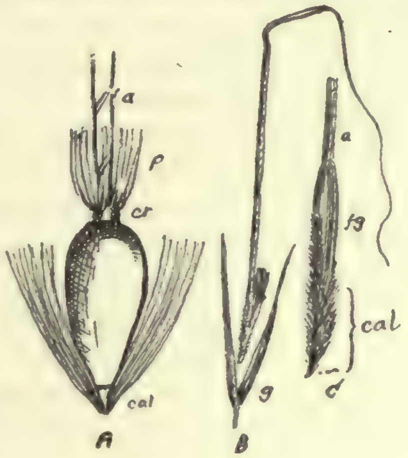

FIG. 31.

Stipa. *cal*, callus; *g*, empty glume; *fg*, floral glume; *cr*, crown; *p*, pappus; *a*, awn. *A*, *S. pampeana*. (After Spegazzini.) *B*, *C*, *S. capillata*. (After Hackel.)

KEY TO THE SPECIES.

A. Awn with long villi to the top. Lower glume exceeding 15 mm. long. Crown none. (*Pilostypa.*)
  b. Lower glumella laxly hairy, not apically attenuate, 2-auricled. Awn 7 cm. long. Stamens 2. Culm rigid. Panicle sheathed, hairy. *pogonathera.*
  b2. Lower glumella glabrous, long-attenuate upwards, or rostrate. Awn naked on lowest fifth part. Panicle subsecund, smooth. Culm 20 cm., slender, hairy. *neæi.*
A2. Awn with long villi only below its joint. (*Pappostipa.*) Panicle contracted.
  b. Awn very long, with long pappus. Culm (35 cm.) and panicle sheathed. Leaves convolute to filiform, glabrous. *vaginata.*
  b2. Awn with lower half nearly naked. Lower glume 1-nerved, upper 3-nerved. Lower glumella attenuate, not auricled. Culm 12 cm., slender, glabrous. Panicle sheathed. *humilis.*
  b3. Awn more or less villous from base. Lower glumella scarcely attenuate, subtruncate, 2-auricled, pubescent. Lower glume 3-, upper 5-nerved.
    c. Culm 30 cm. Leaves rushlike, pungent. Sheath-margins villous. Panicle short. Awn long-villous from base. *patagonica.*
    c2. Culm 35 cm.; leaves short, scabrid. Panicle spike-like. Sheath-margins glabrous. Hairs of awn larger upwards. Glumella silky. *speciosa.*

*c*3. Culm 20 cm.; leaves shorter; nodes dark, smooth. Panicle depauperate. Awn 4-times as long as flower. *ameghinoi.*

*A*3. Awns naked or scabrous or pubescent.

b. Callus long, several times exceeding the floral diameter. Panicle spreading.

c. Crown very long and distinct from the glumella. (*Stephanostypa.*)

d. Flowers smooth, cylindraceous, attenuate upwards. Pedicels elongating after anthesis. *filiculmis.*

*d*2. Callus villous, shorter than the latterly cleft crown. Awn central, slender. Culm slender, 40 cm. *formicarum.*

*c*2. Crown short. Callus ring-like, strong.

d. Flowers rather large (12 mm.), very tetragonal. Glumes silky. Crown with acute lobed mouth. Awn thrice length of flower. Culm 75 cm., exceeding the glabrous leaves. *clarazi.*

*d*2. Flowers small, 5 mm., glabrous. Awn slender, 10 times as long. Culm 35 cm.; leaves setaceous. Panicle contracted. *tenuis.*

*c*3. Crown subconoid, scarcely constricted off. Flowers mediocre, obsoletely 4–6-angled. Callus short, strong. Culm 40 cm. Panicle nodding. *manicata.*

*c*4. Crown none. Flower long, pappose-villous above. Glumes half as long. Culm 30 cm. Panicle spreading. *papposa.*

*c*5. Crown small, constricted off. Flowers mediocre or small, not over 12 mm.

d. Crown appressed, ciliolate-fimbriate. Panicle nutant, depauperate. Culm 35 cm. *ligularis.*

*d*2. Crown silky. Awn excentric. Leaves setaceous. *pampeana.*

*d*3. Crown with truncate mouth, not appressed, nor laxly-ciliolate. Flowers 6–9 mm. *setigera.*

*b*2. Callus short, scarcely exceeding the floral diameter. Crown none or obsolete, not constricted off.

c. Lower glumella pubescent, pilose or villous. Panicle spike-like.

d. Glumes lanceolate, 3–5-nerved, violascent. Upper glumella as long as lower, hairy. Culm stout, 75 cm. *caudata.*

*d*2. Glumes narrowly linear, obsoletely 1–3-nerved. Callus villous. Culm slender; spike erect. *gynerioides.*

*c*2. Lower glumella glabrous to scabrid. Crown none.

d. Upper glumella as long as lower. Callus hairy. Panicle depauperate. Culms slender; leaves convolute, short. *rariflora.*

*d*2. Upper glumella not half as long as lower. Branching of mature panicle repeatedly trichotomous. Leaves setaceous. *trichotoma.*

1. S. AMEGHINOI Speg. (*Pappostipa*).

Glumes lanceolate, 2–3 times longer than the flower with pappus and joint, 3–5-nerved, greenish-hyaline. *Flower* spindle-shaped, villous, but dorsally glabrous in part; *callus* slightly exceeding the diameter of the flower, villous with a ventral foveola. Awn rigid, 4 times as long as the flower, pappose-villous. No crown. *Culms* simple, 10–25 cm., with dark-colored, smooth nodes, often exceeding the convolute, glabrous *leaves*. *Panicle* contracted, with few spikelets, when young sheathed, at length naked.

Patagon., by Golfo de San Jorgo.

2. S. CAUDATA Trin.

Panicle contracted, its rays about 5, some of them floriferous not far above the base, others higher up. *Culms* stout, 40–90 cm. *Leaves* setaceous to rush-like. *Glumes* subequal, lanceolate, 5–6 mm. long, 3-nerved, generally one of them with an apical tail. *Floral-glume* exceeding 4 mm., pilose and with short apical setulæ. *Awn* persisting, flexuous or jointed at center, 12–16 mm. long, with a quasi-pappus at its base. Palea shorter, 2-nerved. *Anthers* very short, bearded.

Chili and near Bahia Blanca; a specimen from N. Patagon. "differs only in the awns being somewhat shorter." (J. Ball.)

3. S. CLARAZI Ball.

60–90 cm. tall with filiform radical and broad cauline *leaves* from inflated sheaths. *Panicles* lax, 25–50 mm. long. *Glumes* comparatively large, to 3 cm., the floral glume acuminate, its hairs silky, its *awn* 5–7 cm. long, scabrous, with a subcylindrical crown surrounded by a short ciliolate pappus. *Callus* villous, as long as 3–4 breadths of the flower, which is subtetragonal, villous on the angles.

N. Patagon., over all the pampas and hills.

4. S. FILICULMIS Del., 1894. (*S. ceresiensis* O. Ktze., 1898.)

Glumes linear-lanceolate, twice or more as long as the flower, hyaline, 3-nerved. Flower subfusoid, glabrous, or obsoletely rough. *Crown* none, but articulation of awn with glumella smooth or ciliolate. *Callus* 2–3 times as long as the floral diameter. *Awn* persisting, long, jointed in lower part. *Leaves* capillary-setaceous; *culms* 20–85 cm., at first shorter, afterwards longer, filiform. *Panicle* linear, depauperate.

Patagon., Argent., through all the pampas, from Chubut northwards.

5. S. FORMICARUM Del.

Cespitose, glabrous, perennial, 20–50 cm. high; culms leafy, erect, with thickish nodes. *Leaves* plane when fresh, about 25 cm. long, acute, not pungent. *Panicle* vaginate, relaxed, nutant. *Glumes* narrow-lanceolate,

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surpassing the flower, 1–3-nerved, hyaline. *Flower* sublanceolate, subglabrous; *crown* largish, ciliate-edged. *Callus* villous. *Awn* persistent, 7 times as long as the flower.

N. Patagon., by Rio Colorado, near Fort Mercedes.

6. S. GYNERIOIDES Phil.

Glumes narrow-linear, twice as long as the flower, exceeding the pappus, 1–3-nerved, subhyaline. *Flower* fusoid, pubescent, apically crowned with pappus-villi of its own length. *Callus* half as long as the floral diameter, villous. Awn subpersistent, 3–5 lengths of the flower. *Culms* 25–90 cm., about equalling the setaceous, scabrid *leaves. Panicle* narrow, scarcely secund.

N. Patagon., Argent., over all the pampas by Rio Negro, and on the hills.

7. S. HUMILIS Vahl.

Root fibrous. *Culm* cespitose, 10–15 cm. high, slender, glabrous. Upper sheath ventricose, sheathing the short, spicate (25 mm.) *panicle.* Rays short, glabrous. *Glumes* acute, one third longer than the 4–6 mm. flower. *Awn* nude and straight at base, above with white hairs, feathery to their joint, thereafter nude and straight again.

S. Patagon., by R. Sta. Cruz.

S. HUMULIS INTERMEDIA O. Ktze.

Awn with a few hairs on the lower third. Leaves straight.

Patagon.

S. HUMILIS DECRESCENS O. Ktze.

Awn with many short hairs at its base. A pilose and also a subglabrous form.

(Argentina); Patagon.

8. S. (PAPPOPHORA) IBARI Phil.

Densely cespitose and rigid, with pilose convolute-setaceous *leaves. Culm* twice as high as the radical leaves, involucrate to the panicle. Nodes white-woolly with deflexed hairs. *Glumes* 17 mm. long, subequal; the flower without hairs at its base. *Floral glume* 7 mm. long, pilose, awn 25 mm. long and long-pilose below its angle.

At Lake Pinto, S. Patagon.

9. S. LIGULARIS (Griseb.) Speg. (*S. neesiana* Trin. v. *ligularis* Gris.)

Glumes long-lanceolate, twice as long as the flower, 3-nerved, violascent. *Flower* subterete, pallid, minutely papillose. *Crown* cup-like, short, with an oblique ciliolate pappus. *Callus* 3–4 times longer than the flower, white-villous. *Awn* persistent, 8–9 times longer than the flower; jointed midway, and at the upper third. *Culms* 25–50 cm., much exceeding the smooth, plane to subconvolute *leaves;* nodes pubescent. *Panicle* rather depauperate, lax, nutant.

(Brazil; Bolivia-Argentina); Patagon.

10. S. MANICATA Desv. 1853. (*S. latissimifolia* O. Ktze.)

Glumes elliptic-lanceolate, often twice as long as the flower, green hyaline, to dark-violet. *Flower* obsoletely 4–5-gonal, villous at the angles. *Crown* cylindric with short cilia. *Callus* just exceeding the diameter of the flower, villous. *Awn* persisting, 7–10 times as long as the flower, jointed below the upper third, and below the middle, subpubescent. *Culms* exceeding the flat, broad, scabrid leaves. *Panicle* mostly profuse, lax, nutant.

(Pampas of Montevideo; Chili); N. Patagon., in meadows and rocky regions.

S. MANICATA MEDIA Speg.

Culms 35–90 cm. *Leaves* usually plane, 4–7 mm. broad, glabrous or hirtellous, dull green. *Panicles* dense, nutant; *glumes* dark-purplish. *Flowers* mediocre, tetragonal.

Patagon., in mountains of Nahual-huapi.

S. MANICATA TYPICA Speg.

Culms 15–40 cm. *Leaves* mostly laxly involute, glabrous, 4–5 mm. broad; they and the sheaths ciliate on margin, green to glaucescent. *Panicle* large, erect or secund. *Glumes* greenish to smoky-purplish. *Flowers* terete-subpentagonal.

Patagon., near Teka-choique, and Carren-leofú.

11. S. NEÆI Nees.

Culm slender, with many nodes, pubescent, hairy below the joints, simple, 15–30 cm. *Leaves* convolute-setaceous, glabrous, dorsally smooth. *Ligule* pilose, lacerous. *Panicle* racemose, contracted, subsecund, smooth. *Glumes* from a colored base, membranaceous-hyaline, setaceous-attenuate, exceeding the short-stiped, lanceolate flower. *Awn* 10 times as long as the flower, slightly twisted at the base, pilose upwards.

(Argentina); Patagon., by Rio Sta. Cruz, and Rio Chubut.

12. S. PAMPEANA Speg.

Glumellæ elliptic-lanceolate, 2–3 times longer than the flower, 3-nerved, dark-purple. *Flower* oblanceolate or obovate, compressed, smooth and shining; on a callus which is rather long, and with long white villi surmounting the flower. *Crown* small, subturbinate, with white villi. *Awn* persistent, 10 times as long as the flower. *Culms* 25–45 cm., slender, sometimes surpassing the smooth subulate-setaceous *leaves*. *Panicle* spicate, depauperate.

(S. Argentina); Patagon., Chubut, by Teka-choique. (Fig. 31, *A*).

13. S. PAPPOSA Nees. 1849. (*S. jarava* Beauv.)

Glumes very narrow, small, about half as long as the flower, 1-nerved, hyaline. *Flower* linear-lanceolate, smooth, rough upwards, abruptly crowned by villi of its own length. *Callus* 2–3 times as long as the flower is broad, white-villous. *Awn* persistent, 3–5 times as long as the flower. *Culms* simple, surpassing the smooth convolute-plane leaves. *Panicle* diffuse, erect or nutant.

N. Patagon., over the pampas from Rio Negro northwards through Argentina. (Mex.)

14. S. PATAGONICA Speg.

Perennial, densely cespitose, 20–35 cm. high. *Caudex* often bearing apical innovations. *Culm* fasciculately leafy, longer than the leaves. *Leaves* convolute, terete-juncoid, rigid, acute-pungent, glabrous. *Sheaths* glabrous, close-appressed, their margin ciliate-pectinate. *Ligules* narrow-velvety; a villous ring on outside at base of lamina. *Panicle* short, contracted. *Spikelets* pediceled; glumes hyaline, subequal, glabrous, twice exceeding the appressed, silky floral glume, which is acutely callus-pediceled. *Awn* geniculate, twice as long as its glume, white-villous below the joint.

S. Patagon., by Rivers Gallegos and Sta. Cruz.

15. S. POGONATHERA Desv. (*S. pulchella* Munro.)

Culm terete, rigid, whitish-pubescent, with glabrous nodes. *Leaves* terete-convolute, hairy inside. *Ligule* oblong, pilose. *Panicle* 15–30 cm. long, sheathed at base, plumose-whitish. Empty *glumes* 3-nerved, narrow, acuminate, the lower larger and twice as long as the flower. *Floral glume* 8–9 mm. long, with awn 7 cm. long, bearded, recurved. *Palea* pilose outside. *Anthers* 2.

(Chili); S. Patagon.

16. S. RARIFLORA (Hook. f. sub *Muhlenbergia*) Benth.

Rigid, glabrous, 10–15 cm. high. *Culm* leafy; leaves much shorter than culm, rigid, setaceous with involute margins. *Panicle* effuse, with about 10 spikelets. *Glumes* subequal, nerveless, shorter than the flower. *Floral glume* lanceolate, coriaceous, glabrous at base, violascent, ending in a very long, rigid, rough *awn*, which embraces the short palea; rachilla bearded. Stamens 3. *Ovary* stiped, contracted above the middle.

(S. Chili, Cape Tres Montes); W. Patagon.; Fuegia.

Closely allied to *S. verticillata* from Australia and to *Apera arundinacea* from New Zealand. (Benth.)

17. S. SETIGERA Presl. (1836, non auct. Am. bor.). (*S. neesiana* O. Ktze. non Trin.)

Glumes long-lanceolate, twice as long as the flower, 3–5-nerved, hyaline or violascent. *Flower* terete, pale or fuscous, smooth, minutely papillose. *Crown* obconical or cup-like, nude or ciliolate, constricted at base. *Callus* 2–3 times exceeding the floral diameter, villous. *Awn* persistent, 7–8 times as long as the flower, jointed near the middle, lower part twisted. *Culms* 10–50 cm., surpassing the convolute-plane, partly hirtellous *leaves*, retrorsely hirsute at the nodes. *Panicle* mostly depauperate, and lax-nutant.

N. Patagon., pampas about Rio Negro and northwards in Argentina.

18. S. SPECIOSA Trin. & Rupr. (*S. chrysophylla* Desv. *S. humilis speciosa* O. Ktze.)

Culms erect, tufted, 20–50 cm. high. *Sheaths* tawny, shorter than the internodes; the upper one inflated. Lower ligule minute, fringed, the upper 2 mm. long. Leaves of sterile shoots erect, scabrid, short; *leaves* of culm 3, involute. *Panicle* spike-like, 6–20 cm. long; rays in pairs bearing 1–3 spikelets. Empty glumes subequal, hyaline, acuminate, 16 mm. long, 3 and 5–7-nerved. *Flowering glume* silky, 5-nerved, 8–12 mm. long, with short callus and 2-toothed hairy apex; its *awn* 3–4 cm., geniculate, twisted, plumose, with many long hairs at its base.

(Argentina); S. Patagon. (Dusén).

19. S. TENUIS Phil. 1870. (*S. argentina* Speg. 1896. *S. neesiana* O. Ktze. 1896, non Trin.)

Glumes linear-lanceolate, 2–3 times longer than the flower, 1–3-nerved, hyaline to violascent. *Flowers* subfusoid, terete, smooth. *Crown* small, turbinate, with a ciliolate circle. Callus 2–3 times as long as the floral diameter, white-villous. *Awn* persistent, slender, 8–12 times longer than the flower, jointed about the lowest fourth, scarcely pubescent. *Culms* 15–45 cm., much exceeding the setaceous or rush-like rough *leaves. Panicle* narrow, depauperate.

N. Patagon. in dry and mountain plains by Rio Negro, and northwards in Argentina (also in California).

20. S. TENUISSIMA Trin. (*S. mendocina* Ph.; *S. oreophila* Speg.)

Glumes lanceolate, 3–4 times longer than the flower, 3-nerved, hyaline, tending to violet. *Flower* long, small, dorsally subgibbous, laterally compressed, glabrous, very delicately rough. Callus as long as the flower is broad, villous, acute. *Crown* small, boss-like, ciliolate. *Awn* persistent, very slender, 25 times as long as the flower. *Culms* 30–50 cm., little exceeding the capillary-setaceous, scabrid *leaves. Panicle* vaginate, contracted.

(Argentina); N. Patagon., by Rio Negro, on dry sandy plains and dunes.

21. S. TRICHOTOMA Nees. (Hack. sub *Nasella*).

Glumes ovate-lanceolate, 3–4 times as long as the flower, 3-nerved, purplish. *Flower* obovate, dorsally gibbous, glabrous to slightly rough. *Crown* none. *Callus* very short, white-villous. *Awn* persistent, 8–15 times as long as the flower. *Culms* slender, 15–50 cm., at first as long as the scabrid setaceous *leaves;* the uppermost internode at length elongating produces a large lax *panicle* with trichotomous rays.

(Argentina, etc.); N. Patagon., over pampas, by Rio Negro.

22. S. VAGINATA Phil.

(Pappophora.) *Glumes* violaceous-green, with hyaline borders, subequal, 14 mm. long. Callus glabrous. *Floral glume* 16 mm. long, white pilose; palea little shorter, glabrous. *Awn* 26–30 mm. long, with long white basal pappus. Plants cespitose, with rigid glabrous *culms* enclosed in the leaf sheaths; *laminæ* convolute, filiform, glabrous, smooth. *Panicle* long, contracted, ensheathed.

Allied to *S. speciosa.*

(Chili, near Aconcagua); Patagon., Chubut, near Cabo Raso; "these differ from the description by having the *awns* villous as far as the joint, and by the floral glume 6, not 16 mm. long." (Speg.)

16. ORYZOPSIS Mich.

Stipeæ. Cespitose grasses, sometimes tall, leaves plane or convolute. *Panicle* terminal, lax, narrow or effuse. *Spikelets* 1-flowered, rachilla jointed above the lower glumes, callose under the flower, not produced above the flower, which is hermaphrodite and terminal. *Glumes* 3, the 2 lower, below the articulation, persistent, subequal, empty. The *floriglume* broad, enclosing the flower and the 2-carinate *palea*, apically obtuse or truncate, its terminal *awn* often excentric, geniculate, and twisted below; it and its awn very caducous. *Stamens* 3. *Grain* oblong, enclosed in the glume, free.

Differs from *Stipa* by its broad floriglume, often oblique.

Species 24, in north temperate regions of both hemispheres and S. Amer.

O. NAPOSTAËNSIS Speg.

Glumes mediocre, lanceolate, twice as long as the flower, 3–5-nerved, violascent. Flower cylindraceous, chestnut to umber-hued. Crown annulate-cupuliform, short; pappus velvet-ciliolate. Anthopodium (*callus*) 4 times diameter of flower, rufous-villous. Awn 6–9 times as long as the flower, jointed below the middle, and at lowest fourth, persisting. Leaves capillary-setaceous, smooth. Panicle depauperate, nutant.

(Buenos Aires); N. Patagon., dry meadows near Carmen.

O. NAPOSTAËNSIS BRACHYSPERMA Speg.

Small, contracted, cespitose. Leaves setaceous, short, 25–50 mm., often somewhat circinate. Glumes small. Awns thickish, the upper joint much below the middle. Anthopodium scarcely half the length of the flower.

N. Patagon., at Pantanosa near Carmen.

O. TUBERCULATA (Desv. sub *Piptochætium*) Speg.

Glumes ovate, exceeding the flower, 5–3-nerved; sometimes violascent. Flower hazel-colored to black, sublenticular, carinate, papillose-verrucose. Crown none or scarcely umboniform. Anthopodium small, short-pubescent. Awn excentric, caducous, 4–5 times as long as the flower. Culms equalling or even exceeding the filiform subglabrous leaves. Panicle contracted-spiciform, often sheathed.

N. Patagon., in dry sandy places near Carmen.

17. MUHLENBERGIA Schreber.

Leaves flat or convolute; *panicle* strict or lax. *Spikelets* 1- rarely 2-flowered. *Glumes* 3–4, the empty glumes acute or awned, the flowering glume 3–5-nerved, obtuse or acute or long-awned; at length enclosing the free grain.

Species 60, chiefly American, a few Asiatic. (Brit. & Br. i, 142.)

M. RARIFLORA Hook. f. (*Stipa rariflora* Benth.)

Rigid, glabrous; the *culm* leafly, the *leaves* setaceous, with involute margins. *Panicle* lax, few to 10-flowered. Spikelets purplish. *Glumes* subequal, nerveless, slightly shorter than the flower. *Floral glume* lanceolate, coriaceous, glabrous at the base, ending in a very long rigid scabrous *awn*, and embracing the shorter *palea*. (Fig. 32.)

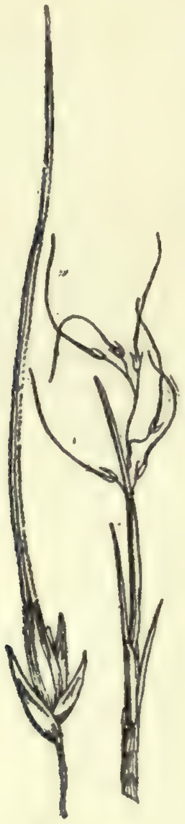

FIG. 32.

Muhlenbergia rariflora. Inflorescence and one spikelet enlarged. (From *Flora antarctica*.)

W. Patagon., Cape Tres Montes; Staaten I.; Fuegia; W. Magellan (Dusén).

18. PHLEUM Linn. Timothy-grass.

Leaves flat. *Panicle* spike-like, cylindrical or ovoid. *Spikelets* 1-flowered. *Glumes* 3, 1 and 2 subequal, keeled and mucronate or awn-tipped.

Floral glume shorter truncate hyaline, enclosing the narrower hyaline palea and flower.

Species 10, in temperate and cold regions.

1. PH. ALPINUM Linn. Mountain-timothy.

15–45 cm. tall. Upper *leaf-sheaths* inflated, the uppermost leaf only 25 mm. long. *Spikes* short, ovoid-oblong, purplish, the *awns* of their upper spikelets long and projecting.

(By Andes from N. parts of N. Amer. and from Eur.) Cobo Negro, S. Patagon. (J. B. Hatcher); throughout Fuegia (Dusén).

2. PH. PRATENSE Linn.

Tall. *Spike* long-cylindrical. Lower *glumes* dorsally ciliate, tipped with a short *bristle.*

(Eurasia and N. Amer., much cult.); Patagon.

19. ALOPECURUS Linn. Foxtail.

Panicle densely spicate; the *spikelets* 1-flowered, jointed on the very short pedicel, 2–6 mm. long, subcompressed. *Glumes* 3, 2 of these empty, acute, not awned; the third obtuse, awned on the back, subtending a *palea* and a perfect flower. (Palea often wanting.)

Species 20, chiefly in north temperate regions.

1. A. ALPINUS Smith.

Culm nearly smooth, erect, 30 cm. tall. *Leaf-sheaths* shorter than the internodes, loose; the *leaf-blades* 2–6 mm. wide, slightly scabrous above. *Spike* ovoid, 4 cm. long, 6–12 mm. thick. *Lower glumes* 4 mm. long, united at base, villous. *Floral glume* as long, with *awn* one third way up. Varies much in size, villosity and in length of awns. (Brit. & Br. i, 149.)

(Arctic and alpine regions; also in Scotland.) Patagonia passim; Falklands; Magellan; Fuegia to Cape Horn. A form at Ushuaia has the floral glumes blue.

2. A. ANTARCTICUS Vahl.

Culm erect, 30 cm. tall, glabrous. *Leaves* narrow, linear-subulate, plane, 5–7 cm. long. *Spike* ovate to 7 cm. long. *Glumes* purplish at apex; *flowering glume* shorter, awned towards base, the awn long. (Fig. 33.)

Magellan; Patagon., Rio Chubut (Dusén).

3. A. GENICULATUS Linn. (*A. aristulatus* Mich.)

Culm smooth, erect, 25 cm. tall. *Sheaths* loose, shorter than the internodes; *leaf-blades* 1–4 mm. wide, scabrous. *Spike* ovoid-cylindrical. *Empty glumes* over 2 mm. long, united only at the base, the keels ciliated. *Floral glume* shorter, obtuse, dorsally awned at its lower quarter, the awns protruding. (Eurasia and N. Amer.; Australia.)

N. Patagon., in valley of Rio Negro and elsewhere; by Rio Gallegos (Barnum Brown). "Gramilla de bañado."

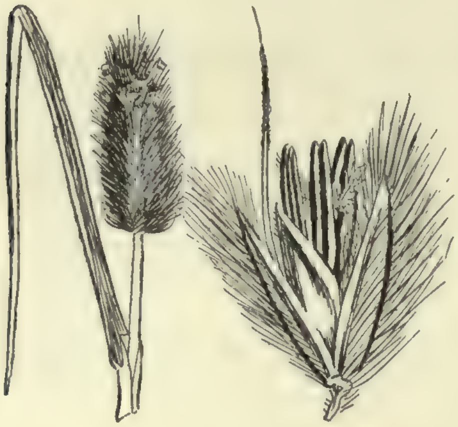

FIG. 33.

Alopecurus antarcticus. Spike, slightly reduced; and magnified spikelet.

4. A. LECHLERI Steud. (*A. magellanica* Lam. *A. alpinus aristatus* Hook. f.)

Culm erect, terete, over 1 m. tall. *Leaf-sheaths* long, glabrous, the *blades* narrow, semi-convolute, acuminate, smooth. *Spike* ovate-oblong, dense. *Glumes* subconnate at base, villous, 3-nerved, equalling the flowers. *Awn* scarcely exceeding the glumes.

Valdivia.

20. SPOROBOLUS R. Br.

Leaves flat or convolute, the throat usually bearded, often sheathing the open or contracted *panicle.* *Spikelets* small, 1- (or 2–3-) flowered. *Glumes* 3, awnless and usually pointless; the first shorter, the floral glume equalling or exceeding the others. *Stamens* 3, occasionally 2; *grain* early deciduous, often thin with the loose seed.

Species 80, many American.

1. S. ARUNDINACEUS Gray (non Vasey). (*Diachyrium.*)

Culm 60–90 cm. tall, smooth, compressed-cylindrical, densely enclosed at base in 10 mm. broad sheaths, leafless above. *Leaves* as long as the culm, cylindrical, pungent, the sheaths being long, woolly-margined: the lower sheaths bladeless. *Panicle* 25 cm. long, 3–4 cm. broad, attenuate both ways. *Pedicels* thick at top, same length as the spikelets. *Empty glumes* lanceolate, acuminate, carinate, longer (5–6 mm.) than the flowering glume and palea.

(Catamarca); N. Patagon. S. Patagon, by Rio Chico.

2. S. INDICUS R. Br.

Stout, erect, glabrous, 3–12 dm. tall, tufted. *Leaves* long, attenuate to a slender point; their *ligules* a ring of short hairs. *Glumes* 1 and 2 unequal, half as long as the floral glume.

(N. and S. Amer., Brit. & Br., i, 154.) N. Patagon.

21. POLYPOGON Desf. Beard-grass.

Mostly decumbent annuals with flat *leaves* and usually spike-like *panicles*. *Spikelets* 1-flowered; *glumes* 3, all awned; nos. 1 and 2 empty, no. 3 smaller and subtending a shorter palea and its flower. *Stamens* 1–3. *Grain* free, enclosed in the glume and palea.

Species 10, extra-tropical. (Brit. & Br. i, 157.)

1. P. CHONOTICUS Hook. f.

Panicle large, oblong; its branches smooth but its pedicels rough. *Leaves* shorter than their sheaths. *Glumes* pubescent, obliquely truncate with *awns* twice as long as the flowering glume, which is 5-nerved and 5-awned.

Chonos Archip. and Cape Tres Montes.

2. P. ELONGATUS H. B. & K. (*P. littoralis* Smith.)

Culm simple, nodes glabrous. *Leaves* rough-margined. *Panicle* narrow, 10–30 cm. long, heads if larger nodding. *Rays* numerous, slender. *Spikelets* 2.5 mm. long. *Glumes* hispid at the nerve, aculeate to a seta. Floral glume half as long, bearing a seta. *Palea* shorter.

Eurasia; S. Amer.

3. P. ELONGATUS PATAGONICUS Speg.

Panicle more lax than in the type, subinterrupted, purpurascent, more or less sheathed by the upper leaf. *Ligule* short, toothed. *Awn* thrice as long as its glume.

S. Patagon., by R. Sta. Cruz; Chubut.

4. P. MONSPELIENSIS Desf.

Panicle densely spike-like. *Glumes* 2 mm. long, obtuse, bifid, scabrous. *Flowering glume* shortly erose-truncate. (In tropics and temperate parts of both hemispheres.)

N. Patagon. "Very common about Bahia Blanca in the valley of Rio Negro and elsewhere in N. Patagonia." (J. Ball.)

22. AGROSTIS Linn. Bent-grass.

Panicles effuse, of very many 1-flowered spikelets. *Glumes* 3, two empty, keeled, acute; the third or floral glume is shorter, obtuse, often dorsally awned. *Palea* short or wanting. *Grain* free, enclosed in the glume. *Seed* adhering to the pericarp.

Species 100, cosmopolitan, chiefly in temperate climates.

Key to the Species.

- *A.* Floral glumes awned.
  - *b.* Leaves glabrous.
    - *c.* Panicle lax.
      - *d.* Cespitose. Culm 30 cm., naked. Leaves filiform, short. Spikelets minute. Awn short, caducous. Palea none (?). *kufuim.*
      - *d2.* Panicle nodding or inclined, its rays rough, culm erect, cespitose. Floriglume 4-toothed.
        - *e.* Culm 50 cm. Leaves long, linear-lanceolate. Glume 4 mm. long, 3 times as long as its flower. *magellanica.*
        - *e2.* Culm 5–60 cm. Leaves flat. Panicle dense. Floriglume exceeded by its awn. *antarctica.*
      - *d3.* Panicle ovate, its branches forking. Leaves involute. Glumes unequal. Floriglume broad-ovate. *airoides.*
      - *d4.* Panicle green-violet. Empty glumes 3 times as long as the truncate floriglume. Awn long, straight. Culms 18 cm., sheathed. *rinihuensis.*
    - *c2.* Panicle contracted. Culm 27 cm., sheathed. Leaves flat. Glumes violet; floriglume half as long as empty glumes; awn protruding. *vaginata.*
  - *b2.* Leaves smooth, but with rough edges. Glumes subequal; floriglume smaller.
    - *c.* Panicle contracted, rays 1-spiculate. Culm 18 cm., sheathed. Palea as long as the bifid floriglume. *lechleri.*
    - *c2.* Panicle lax. Cespitose; culms 50 cm., nodeless upwards. Palea shorter than the obtuse floriglume. *paucinodis.*
    - *c3.* Panicle lax, lucidulous. Culms 45 cm., scabrous upwards. *exasperata.*
  - *b3.* Leaves plane, smooth, but upper surface rather rough. Culms 35 cm., smooth, naked; rootstock creeping. Spikelets minute; palea none; floriglume enclosing grain, often awnless. *pyrogea.*
  - *b4.* Leaves pubescent or scabrous.
    - *c.* Culms smooth.
      - *d.* Panicle lax.
        - *e.* Panicle straw-purple, oblong. Culms 35 cm., with leafy offsets. Leaves setaceous, pungent. A floral rudiment. *nardiflora.*
        - *e2.* Panicle dense, cernuous, many-rayed. Culm 75 cm., leaf-sheaths glabrous. Awn terminal, short. *patagonica.*

*e*3. Culm 70 cm. Leaves convolute-filiform. Glumes 6 mm., purplish. Awn long. *antoniana.*

*d*2. Panicle contracted. Culms 50 cm.

e. Awn long. Spikelets large. Glumes slightly exceeding the flowers. *brachyathera.*

*e*2. Awn short. Spikelets small. Glumes 4 times as long as the flowers. *macranthera.*

*e*3. Awn bent. Spikelets only 1 mm. long. Floriglume obtuse. Leaves 5 cm. long, plane. *canina.*

*c*2. Culm rough, 60 cm., from a creeping rootstock. Leaves linear-lanceolate, retrorsely scabrid. Awn long. Palea none. *cognata.*

*A*2. Mostly awnless, sometimes with awns.

b. Pubescent. Panicle spreading, erect; spikelets violaceous. Culm jointed at base, glabrous. Leaves convolute or subsetaceous, with auricles for ligules. *aberrans.*

*b*2. Scabrous.

c. Culm 30 cm., glabrous. Panicle exserted, green to purplish-brown, at length contracting. Leaves flat, with long ligules. *alba.*

*c*2. Culm 40 cm. Panicle dense, exserted.

d. Leaves flat, or involute. Empty glumes subequal. Floriglume truncate, toothed. *exarata.*

*d*2. Leaves subsetaceous. Floriglume 4-toothed. Palea shorter or none. *tenuifolia.*

*b*3. Smooth, varying. Leaves narrow, acute. Panicle strict; its rays di- to trichotomous. *moyanoi.*

*A*3. Acute-awned. All glabrous. Lower 3–4 nodes sheathed. Leaves shortish, plane. Panicle spike-like, erect; rays densely spiculiferous. *tehuelcha.*

*A*4. Awnless.

b. Annual. Culm 30 cm., nodeless above. Sheaths rough. Panicle lax, its rays opposite. Glumes straw-colored. *serranoi.*

*b*2. Glabrous perennials.

c. Panicle lax.

d. Panicle naked below. Glumes 3 mm., yellowish-violet; floriglume slightly shorter. *fuegiana.*

*d*2. Culm 65 cm., naked above. Rays in 2's. Glumes 4 mm., floriglumes half as long. *oligoclada.*

*d*3. Culm 30 cm., from a creeping base, branching, sheathed. Leaves distichous, short. Floriglume as long as empty glumes. *distichophylla.*

*c*2. Panicle contracted. Spikelets small.

d. Erect, culms 20 cm. Spikelets straw-colored. Glumes subequal, exceeding the flower; floriglume 3-toothed. *flavidula.*

*d*2. Creeping; culm 9 cm., stoloniferous. Leaves flat. Floriglume truncate, nerveless. *prostrata.*

*c*3. Panicle slightly contracted, spikelets small. Keel of glumes rough, acute-awned. Culm sheathed half-way. Leaves plane, shortish. Rays spiculiferous from the base. *sanctacruzensis.*

*b*3. Scabrous and strict. Panicle contracted, glabrous. Rays in umbellate verticils. *umbellata.*

1. A. ABERRANS Steud.

Culms 1-jointed at base, then erect, glabrous. *Leaf-sheaths* long, striate, pubescent, with hyaline, obtuse auricles for ligules. *Leaves* narrow, convolute or subsetaceous, much shorter than the culms. *Panicle* erect, spreading, the rays 4–7-whorled; subrays few-flowered. *Spikelets* lance-linear, acute, violaceous. *Floral glumes* subequal, acute, glabrous, mostly awnless.

Magellan.

2. A. AIROIDES Franchet.

Cespitose, with many sterile fascicles. *Culms* sulcate, smooth. *Leaves* all involute, 2–3 on the culm, with short blades. *Panicle* ovate, the branches dichotomizing; the pedicels capillary, scabrid, spreading, 4–7 times as long as the flower. *Glumes* unequal, the lower slightly longer, the flowering glume hyaline, broad-ovate, truncate or toothed, awnless.

Magellan, Punta Arenas; Fuegia, Elizabeth I., remarkable for rush-like, rigid, pungent leaves. (C. Speg.)

A. AIROIDES FLACCIDIFOLIA Speg.

"Differing from the species by having leaves convolute, flaccidulous, and smaller spikelets (1.5–1.75 mm. long); from *A. leptotricha* Desv. by smaller *spikelets*, and *floriglume* smooth, always solitary; from *A. moyanoi* Speg. by smooth *floriglume* and *panicle* rays shorter and more rigid." (Speg.)

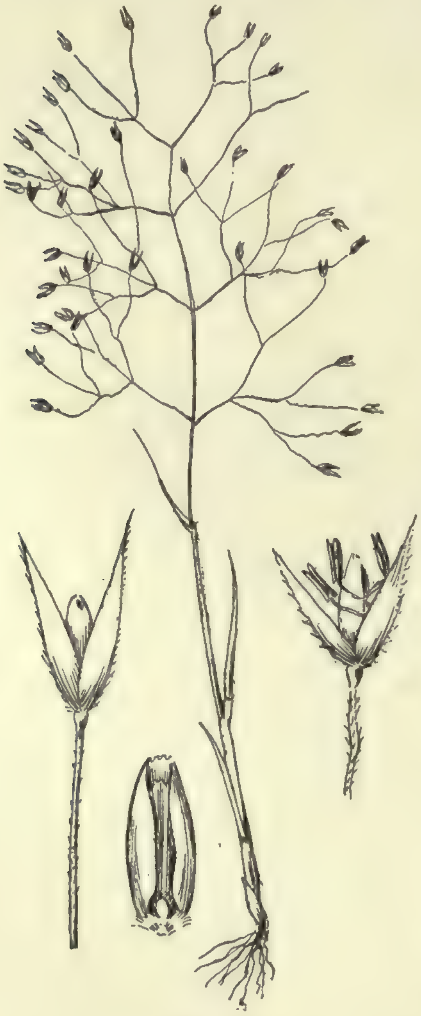

FIG. 34.

Agrostis airoides. Plant, in center; natural size; young and open spikelets, and floral glume with palea. (After Franchet.)

3. A. ALBA Linn. Red-top.

Culms to 30 cm. tall, glabrous. *Sheaths* shorter than the internodes; ligules to 8 mm. long; *leaf-blades* 2–6 mm. broad, scabrous. *Panicle* at first open, becoming contracted, green-purple or brown; the palea conspicuous, at least one third as long as the rather short truncate floral glume. (Fig. in Brit. & Br. i, 159.)

(Eur. and cult. in N. Amer.) Falklands, perhaps introduced.

4. A. ANTARCTICA Hook. f.

Erect, cespitose, 5–60 cm. tall, nodding or inclined, somewhat dense-flowered and with whorled branches and scabrid pedicels. *Glumes* equal, scabrid on the keel, twice as long as the flower, which is glabrate at base. *Floral glume* truncate, 4-cuspidate, 5-nerved with an *awn*, exceeding the glumes. Palea small. Scales oblong, scimeter-shaped, subacute (Fig. 35).

Swampy land, abundant and elegant. Chonos and Fuegia to Cape Horn; Churucca; Falklands [Kerguelen I.]. (Possibly a var. of *A. magellanica.*)

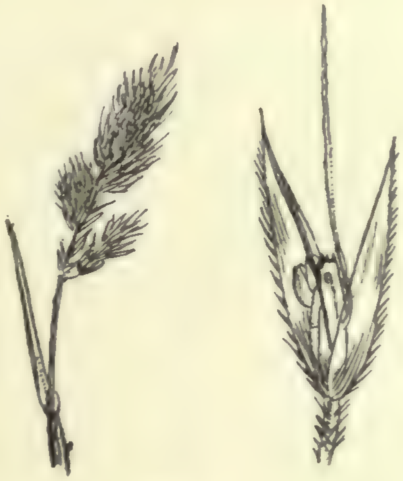

FIG. 35.

Agrostis antarctica. Inflorescence and spikelet with awn. (*Flora antarctica.*)

5. A. ANTONIANA Gris.

Culm 45–90 cm. tall, smooth. *Leaves* convolute-filiform, rough, often 30 cm. long, strict; ligule long. *Empty glumes* 6 mm. long, slightly exceeding the flower, purplish dorsally; *awn* rather long. *Floral glume* 4-toothed.

Near *Calamagrostis*, but distinct by the sterile glumes being broader, acutish, awned dorsally below the middle.

(Andes of Peru; Argentina); Patagonia (?).

6. A. BRACHYATHERA Steud.

Culm erect, strict, smooth, 50 cm. tall. *Leaves* very narrow, acute, scabrid, 6 cm. by 1 mm.; ligule hyaline, oblong. *Panicle* contracted; *rays* in semiwhorls of 4–6, unequal, dividing into few-spiculate raylets. *Spikelets* small, to 2 mm. long; *glumes* keeled, rough, exceeding the flowers; floral glume usually awned, the *awns* not exceeding the glumes.

Magellan; Fuegia.

A yellowish specimen represents the typical form, the floral glume awned; a violet specimen represents the muticous form.

7. A. CANINA Linn. Brown Bent-grass.

Culms erect, 50 cm. tall, slender, glabrous. *Leaves* 3–7 cm. long, 2 mm. wide, scabrous. *Panicle* contracted, the branches slender, naked below. *Spikelets* 1 mm. long on appressed pedicels, the *floral glume* two thirds as long as the others, obtuse, smooth, with a somewhat bent dorsal awn. (Eur. and N. Amer. with varieties.)

Punta Arenas; Beagle Channel; Brecknock Pass. (Fig. in Brit. & Br. i, 160.)

A. CANINA FALKLANDICA Hook. f.

Radical *leaves* filiform, shorter than the slender *culm*. *Glumes* equal, ovate-lanceolate, acuminate, scabrid on the keel, exceeding the flowers; floral glume erose-truncate, its *awn* short or none; palea wanting.

Magellan; Falklands. "A specimen of *A. canina* from Punta Arenas by Dr. Sabatier has some of the leaves setaceous-involute, and others flat-linear; the former is like *A. Falklandica*." (Franchet.)

8. A. COGNATA Steud.

Rhizome creeping. *Culms* erect, about 60 cm. tall, striate, rough below the panicle; ligules exserted, hyaline; *leaf-blades* linear-lanceolate, acute, retrorsely scabrid, 12 cm. long. *Panicle* oblong, lax, flexuose, slightly nodding; rays capillary, rough, floriferous nearly from base. *Spikelets* lanceolate, 3 mm. long; *glumes* subequal, violaceous and green, the keel spiny-scabrid, twice as long as the flower; floral-glume bifid with a dorsal jointed *awn* exceeding by half the empty glumes; palea none.

9. A. DELFINI Phil.

Panicle about 20 cm. long, with 5 branches in semi-whorls. Pedicels 1–2 times as long as the 2 mm. spikelets. *Glumes* green, smooth; floral glume three fourths as long as the others; *awn* as long as the glume.

W. Patagon.; by Rio Palena, W. of the Cordilleras.

10. A. EREMOPHILA Speg. (*A. distichophylla* Phil. non R. & S.)

Creeping (?), branching at base, glaucous, glabrous. *Culms* 30 cm. tall, both sterile and fertile enclosed in leaf-sheaths. *Leaves* crowded, distichous, short; the ligules very short. *Panicle* large, pyramidal, 12 cm. long; *glumes* equal, lanceolate; floral glume as long, acuminate; palea nearly as long; these glabrous.

(Atacama); N. Patagon., in dry stony places near Colu-huapi. "Glumes always conspicuously shorter than the flower." (Speg.)

11. A. EXARATA Trin.

Culms erect, 30–60 cm. tall. *Leaves* mostly erect. *Panicle* narrow, crowded, greenish, the rays floriferous from the base; spikelets 3–4 mm. long; *glumes* subequal, acute, the floral glume shorter, sometimes awned above the middle; palea shorter or none.

(W. of N. Am., Brit. & Br. i, 160.)

A. EXARATA ANGUSTIFOLIA Hackel.

Leaves of innovations very narrow, scarcely 1 mm. broad; often convolute; those of the culm broader. *Culm* 15 cm. tall.

East Fuegia (Dusén).

12. A. EXASPERATA Trin.

Culm simple, 45 cm.?, scabrous upwards; nodes and sheaths glabrous; ligule sublinear, obtuse. *Leaves* plane, 5–10 cm. long, 2–3 mm. broad, roughish on edge. *Panicles* spreading, 7–10 cm., lucidulous, with several semi-whorls of rays, the shorter floriferous from the base, the longer upwards. *Spikelets* pallidly virescent. *Glumes* subequal, linear, hispidulous. *Floriglume* half as long as the empty glumes, glabrous, with shortly denticulate apex, bearing an erect *seta* which exceeds the glume. *Palea* one third as large. Callus hairless; rudiment none.

(Chili); Patagon., elevated meadows near Carren-leofú.

13. A. FLAVIDULA Steud.

Culms erect, 20 cm. tall; *leaf-sheaths* striate; ligules exserted, hyaline. *Panicle* contracted, 5–7 cm. long; rays semi-whorled, naked at base, divided upwards. *Spikelets* straw-yellow, linear, small; *glumes* subequal, ovate-lanceolate, acute, slightly keeled, exceeding the flower; floral glume slightly 3-toothed, enclosing the smooth oblong grain; palea none.

Magellan; Fuegia, Ushuaia.

14. A. FUEGIANA Hack.

Cespitose, perennial, with extravaginal innovations. *Culms* erect, to 60 cm. tall, glabrous, binodal, naked upwards. *Leaves* glabrous, their sheaths shorter than the internodes; ligules ovate, acutish; blade linear, 10 cm. by 3–4 mm. (of the innovations narrower). *Panicle* ovate, 12 cm. long, lax, the branches in 2–4's; naked below. *Spikelets* crowded above, lanceolate, 3 mm. long, violet and yellowish. *Glumes* equal, lanceolate, 1-nerved, keel rough; floral glume two thirds as large, oval, round-truncate, 5-nerved, awnless; palea one third as long, nerveless.

South Fuegia. (Dusén.)

15. A. KUFUIM Speg.

Cespitose, glabrous, perennial; long, naked *culms* 20–40 cm. tall, and with subfiliform leaves, which are short, convolute, striate, having ovate rather long ligules. *Panicle* long, lax, the rays subtrichotomous, apically spiculiferous. *Spikelets* ovate, minute, glabrous. *Glumes* not keeled; floral glume with a short caducous awn; *flowers* not bearded at base.

S. Patagon.; Fuegia.

16. A. LECHLERI Steud.

Pale green. *Culms* jointed, erect, glabrous. *Leaf-sheaths* as long as the internodes, lax, glabrous; ligule exserted, hyaline, toothed or cleft; leaf-blades lanceolate, acute, margin rough. *Panicle* long, contracted, from upper leaf; *rays* 2–3-nate, pedicels long, 1-spiculate. *Glumes* subequal, ovate-lanceolate, cuspidate, exceeding the flower; floral glume bifid, dorsally awned; palea similar except the awn.

N. W. Patagon., by Valdivia.

17. A. MACRANTHERA Phil.

Culm 45 cm. long, leafy to the top, smooth. *Panicle* contracted; pedicels equalling the spikelet, 4 mm. long; *glumes* subequal, acuminate; floral glume 1 mm. long, ending in a long awn, 4 mm.

W. Patagon., by Rio Palena.

18. A. MAGELLANICA Lam.

Cespitose, glabrous. *Culms* simple, 30–60 cm., rough below. *Leaves* plane, long linear-lanceolate, gradually narrowing; ligule oval-lanceolate. *Panicle* long, lax, erect, nodding or inclined, its branches scabrid; *glumes* rather large, equal, glabrous or finely pilose, three times as long as the flower, which is bearded at the base; floral glume 4-toothed, 5-nerved, awned midway on back; palea half as long.

Like *A. antarctica* Hook. f., but has larger glumes, greater size, and conspicuous palea.

(S. Chili; also in Kerguelen I., and in islands off coast of New Zeal.); S. Patagon., by RR. Sta. Cruz & Gallegos; Magellan; S. Fuegia; Falklands.

"My specimens have appressed-hirsute peduncles and rachis, glumes subequal, 1-nerved, dorsally rough, 4 mm. long; flower small (1.5 mm. long); the awn scarcely exceeding the glumes." (Speg.)

19. A. MOYANOI Speg.

(Glabrivalve, univalve, muticous.) Grasses densely cespitose, glabrous. *Leaves* rather plane, narrow, acute; ligule ovate, dentate. *Culms* rather tall, clothed to the top. *Panicle* strict, spathaceous-leafy, *rays* di- to trichotomous, laxly rough, naked, 1-spiculate at the apex. *Spikelets* ovate-oblong, acute. *Glumes* carinulate, dorsally rough, enclosing the shorter glabrous *flower*.

Patagon., in meadows along Rio Carren-leofú. Grass 30–50 cm. high. Allied to *A. leptotricha* Desv. but distinguished by its usually 1-nerved floriglume, and the palea altogether wanting.

A. MOYANOI MAJOR Speg.

Culm leafy to the top, *panicle* secund, virescent; *spikelets* large (3–3.25 mm. long); flower larger (2 mm.), more 3-nerved and more rough.

Near Carren-leofú.

A. MOYANOI PLICATIFOLIA Speg.

Leaves rigid, glaucescent, plicate; *spikelets* dark-purplish, floriglume very 3-nerved, and often awned on the back.

By Rio Chubut.

A. MOYANOI PUBERIGLUMA Speg.

Glumes more or less densely pubescent-rough; flower equalling the glumes.

By Rio Carren-leofú.

20. A. NARDIFLORA Griesb.

Rhizome cespitose, descending, with dense-leaved offshoots. *Culm* 20–30 cm. tall, smooth, exsert from the pale glabrous sheaths; ligules acuminate; *leaf-blades* convolute-setaceous, recurved, pungent. *Panicle* oblong, purple-stramineous, pedicels rough; *empty glumes* lance-acuminate, exceeding the flower; *floral glume* 5-nerved, its apex lacerate; *awned* above the base; with rudiment of a second flower and a long pilose callus.

N. Patagon.; Catamarca.

21. A. OLIGOCLADA Phil.

Cespitose, 65 cm. tall. *Culm* naked at the top, smooth; as are the leaves. *Panicle* very lax; 2 branches in each semiverticil. *Glumes* green to violet, 4 mm. long; floral glume half as long, awnless.

W. Patagon.; by Rio Palena.

22. A. PATAGONICA Phil.

Culm erect, 60–90 cm. tall, smooth, leafy to the top. *Leaves* rough on both sides, their sheaths glabrous; ligules oblique, 4 mm. long. *Panicle* 20 cm. long, dense, cernuous; rays 20 or more in the lower whorls, unequal; *pedicels* capillary, rough, as long as the spikelets. *Glumes* nearly 3 mm. long, ovate-acute, ciliolate-carinate; floral glume scarcely half as long, ovate, 5-nerved, with a short terminal *awn; palea* half as long as the floral glume.

N. Patagon.; by Lago Nahuel-huapi.

23. A. PAUCINODIS Hack.

Cespitose, erect, geniculate, with 1, rarely 2, nodes, both in the lowest quarter of the 50 cm. *culm*, compressed, glabrous. *Sheaths* compressed, all split, scaberulous upwards. *Ligules* 3–4 mm. long, truncate; *leaf-blade* 8–10 mm. by 4–5 mm., flat, glabrous, except on the edges and upper surface. *Panicle* broad-ovate, lax; the rachis scabrous upwards; rays whorled, the lower 7–10, unequal, undivided, and naked nearly halfway up. *Spikelets* pallid. *Glumes* subequal, narrow-acuminate, setaceous, keeled; keel of second glume scabrid. Floral glumes broad-ovate, half as long as the others, glabrous, entire, 5-nerved, obtuse, awned. Callus minutely bearded. Palea smaller, oval-oblong.

Magellan.

24. A. PROSTRATA Hook. f.

Low, glabrous, creeping; *culm* 8–10 cm. tall, stoloniferous. Leaves rather plane and smooth. *Panicle* linear-oblong; floral glume truncate, nerveless and awnless. Allied to *A. alba stolonifera*, but distinguished by smaller size, coarctate panicle, smaller spikelets and flowers, and absence of awn.

Falklands, rare.

25. A. PYROGEA Speg.

Rhizome creeping. *Culms* long, 30–40 cm., naked. *Leaves* plane, rather rigid, striate, upper surface somewhat rough, abruptly triangular-acute at apex; ligules long-lanceolate. *Panicle* lax, the rays smooth, nude, alternately spiculiferous at the apex. *Spikelets* ovate, minute, glabrous; the *glumes* subequal; scarcely exceeding the flower, not keeled; *floral glume* enclosing the grain, 5-toothed, with a fine dorsal awn; palea wanting; flowers bearded at base.

S. Patagon., by Lago Argentina; Fuegia, maritime dunes and sands.

26. A. RINIHUENSIS Phil.

Cespitose. *Culms* 18 cm. tall, sheathed to the panicle. *Leaves* plane or folded, smooth. *Panicle* green-violet, 6 cm. long, rays in semi-verticils 3–5, spiculiferous at apex. *Glumes* glabrous; floral glume one-third as long as the lower, truncate, toothed, hyaline; the *awn* arising upward, straight, 6 times as long as the glume.

Patagon., valley of Rio Rinihue.

27. A. SANCTACRUZENSIS Speg.

(Glabrivalvule, bivalvule, microvalvule.) *Awnless*, all glabrous. *Leaves* plane, narrow, mediocre, herbaceous; ligules ovate-lanceolate, long. *Culms* with 2–3 lower nodes sheathed beyond the middle. *Panicle* laxly subcontracted, narrow, subcernuous, interrupted; rays moderately long, the shorter erect-appressed, the longer spreading from their base, densely spiculiferous from their base or middle. *Spikelets* lanceolate, small. *Glumes* very acute, but not awned, spinulose-scabrid on the keel and sides. Callus obsoletely and very shortly bearded antrorsely.

S. Patagon., in wet places along Rio Sta. Cruz.

28. A. SERRANOI Phil.

Annual. *Culm* 27–40 cm. tall, the highest internode very long. *Leaves* plane above, the sheaths roughish. *Panicle* lax, divaricate; the rays and raylets opposite, not whorled. *Glumes* stramineous; the floral glume half as long as the lower, *awnless.*

W. Patagon.; by Rio Palena.

29. A. TEHUELCHA Speg.

(Glabrivalvule, bivalvule, microvalvule.) *Awnless*, all glabrous. *Leaves* plane, narrow, rather short, herbaceous; ligules ovate, longish. Lower 2–3 nodes of the *culm* sheathed above the middle. *Panicle* contracted, spike-like, lobately subinterrupted, erect; *rays* short, appressed, densely spiculiferous from the base or nearly so. *Spikelets* lanceolate, small. Keel and sides of *glume* spinulose-rough, acute-awned. Callus glabrous.

Patagon., in wet places along Rio Sta. Cruz, and Carren-leofú.

30. A. TENUIFOLIA Bieb.

Culms about 50 cm. tall, with subsetaceous, obscurely scabrid *leaves. Floral glume* truncate, 4-toothed, 4-nerved, with or without a short dorsal awn; *palea* none, or very short. (Near *A. exarata* Trin.)

(Eurasia); Magellan.

31. A. UMBELLATA Colla.

Culm and linear *leaves* both strict and rather scabrous. *Panicle* contracted, glabrous. *Rays* verticillate, the verticils umbellate; raylets capillary, subquaternate, 1-flowered. Empty and floral *glumes* equal, acuminate, scarious, *awnless. Grain* free.

(Chili); Chubut, in mountain meadows near Rio Carren-leofú. The Patagonian specimens vary; spikelets stramineous or violascent.

32. A. VAGINATA Phil.

Culm 27 cm. tall, entirely sheathed. *Leaves* 3 mm. broad, smooth, also the sheaths. *Panicle* contracted, 6–5 cm. long, the semi-verticils approximate. *Glumes* violet; floral glume half as long as the lower, its *awn* exserted.

W. Patagon.; valley of Rio Palena.

23. CALAMAGROSTIS Adans. (including *Deyeuxia* Clar.).

Panicles having 1-flowered spikelets, often with the rudiment of a second. Glumes 3, 2 of them empty, keeled, the third or floral glume, shorter, obtuse, dorsally awned, hairy at the base, enclosing a shorter palea and a flower; the rudimentary second flower being usually a prolonged, tufted rachilla. Grain free; seed adherent to the pericarp.

Species 130, in temperate and cold parts of the E. and W. Hemispheres; and many in the Andes. The new-world species belong to the section *Deyeuxia*, having hairy prolongation of the rachilla, and the callus hairs short or obsolete.

KEY TO THE SPECIES.

- *A.* Panicle lax. Floriglumes awned.
  - *b.* Scabrid. Glumes subequal, nearly twice as long as the flower.
    - *c.* Low, cespitose, 10 cm. Panicle purplish. Spikelets long, 30 mm. *erythrostachya.*
    - *c2.* Tall, 70 cm., from a creeping root. Panicle subsecund, partly nutant. *montevidensis.*
  - *b2.* Smooth.
    - *c.* Awns and glumes 4 mm. Spikelets 6 mm. Cespitose, culms 8 cm. Panicle narrow, lax, secund. *suka.*
    - *c2.* Awns short.
      - *d.* Glumes 4 mm., violet. Floriglume 2 mm. Culm 60 cm., naked above. Rays in 3's and 5's. *laxiflora.*
      - *d2.* Glumes 6 mm. Panicle large, rays in 2's and 3's. *hirthi.*
      - *d3.* Glumes subequal, as long as the flower and the awn. Culm 50 cm., from a creeping base. Leaves rough-edged, at first flat. Panicle narrow, spreading. *neglecta.*
- *A2.* Panicle contracted, mostly spike-like. All glabrous.
  - *b.* Awnless. Small, 12 cm., from a creeping root, with small flat leaves. Panicle few-flowered. Spikelets 3 mm., with rudiment of a second flower. *freticola.*
  - *b2.* Awned.
    - *c.* Leaves plane.
      - *d.* Culm 20 cm., rough upwards. Rays short. Spikelets 3 mm. No second rudiment. *fuegiana.*
      - *d2.* Culm robust, 65 cm. Glumes 5 mm. Floriglume truncate. Awn short. *magellanica.*
      - *d3.* Culm glabrous, sheathed above second node. Floriglume with long basal villosity, and awn its own length. *patagonica.*
    - *c2.* Leaves convolute. Culm 45 cm. Rays short, few-flowered. Spikelets only 2 mm., bluish. Awn short. *poæoides.*
    - *c3.* Leaves complicate, subpungent. Culm erect, 3–4 nodes sheathed. Spikelets small, 1-flowered. Floriglume with short basal hairs, and short awn. *ameghinoi.*

1. CALAMAGROSTIS (DEYEUXIA) AMEGHINOI (Speg.).

Chætophora; not or scarcely subcespitose, glabrous, stoutish; *culm* erect, straight, 3–4 nodes below the middle sheathed more than half way. *Leaves* more or less complicate, pallidly green, glaucescent, rather rigid, subpungent, not scabrid. Ligule very short, truncate. *Panicle* contracted, spike-like, obscurely violascent, subcontinuous. *Spikelets* small, 1-flowered; rachilla villous, more than half as long as the flower. *Glumes* subequal, violascent, scarcely carinate, not scabrid, acutish, 3-nerved. Flower slightly shorter than the glumes, and more pallid. Floriglume 5-nerved; the dorsal nerve usually ending in a *short awn;* apex truncate, 6-dentate, its base densely surrounded with white hairs nearly as long as itself.

S. Patagon., in dry meadows by Rio Chico, near Chonkenk Aike.

2. C. ERYTHROSTACHYA Desv.

Culms cespitose, 5–12 cm., smooth. *Leaves* convolute, setaceous, scabrid. *Panicle* purplish; spikelets 25–35 mm. long. *Lower glumes* subequal, narrow, acuminate, dorsally scabrid, scarcely twice as long as the flowers. *Floral glume* ovate, 4-nerved, 2-lobed, the lobes 2-toothed, awned above their base; the *awn* twisted below. Palea shorter, and still shorter in the sterile flowers.

(Chili); Fuegia.

3. C. FRETICOLA (Speg. sub *Deyeuxia*).

Creeping, small; *culms* slender, sheathed to the top, 10–15 cm. tall. *Leaves* small, plane, glabrous with short truncate ligules. *Panicle* small, spike-like, few-flowered; spikelets 1-flowered with a rudiment of a second. *Floral glume* obtusely toothed at top, *not awned* nor mucronate, embracing the longer palea.

Fuegia; Magellan.

4. C. FUEGIANA Speg.

Cespitose, glabrous; *culm* erect, 20–25 cm. long, sheathed, rough upwards, exceeding the leaves; *leaves* plane, ligule very short. *Panicle* spike-like, its rachis rough, its rays short. *Spikelets* dense, 3 mm. long, lanceolate, *glumes* equal. No rudiment. Flowers villous at base; floral glume awned below the apex.

Magellan, Punta Anegada. S. Patagon. by R. Sta. Cruz.

5. C. HIRTHI Phil.

Tall and smooth. *Panicle* very large, lax, with 2's and 3's of capillary branches which are naked below. *Glumes* 6 mm.; palea 4-toothed above, the *awn* scarcely surpassing it.

W. Patagon., Valley of Rio Palena.

6. C. LAXIFLORA Phil.

60 cm. tall, smooth, naked above; *leaves* plane, short. *Panicle* 17 cm. long, rather lax, with semi-verticils of 3–5 rays. *Glumes* 4 mm. long, violet; floral glume half as long, surrounded by soft hairs of its own length; very shortly *awned*.

W. Patagon., Valley of Rio Palena.

7. C. MAGELLANICA Phil.

Culm robust, 65 cm. or more in height. Leaves plane, 4 mm. broad, smooth, as are their sheaths; *leaves* of sterile shoots shorter. *Panicle* above the leaves, 12 cm. long, contracted, its rays scabrid. Pedicels short. *Glumes* 5 mm. long, green, hyaline at top; floral glume truncate and toothed, briefly awned.

Magellan.

8. C. MONTEVIDENSIS Nees.

Root creeping, ringed. *Culm* simple, smooth, 60–90 cm. tall. *Leaves* linear, scabrid, the ligules short, round, at length lacerate. *Panicle* semi-verticillate, spreading, subsecund, apically nodding. *Glumes* subequal, linear-lanceolate, acuminate, nearly twice as long as the flower. Floral glume only exceeding the palea; the hairs as long as the flower or longer. Apical *awn* exserted.

N. Patagon. (and Montevideo).

9. C. (DEYEUXIA) PATAGONICA (Speg.).

Cespitose, glabrous. *Leaves* plane, rigid, scaberulous, shorter than the glabrous *culm* which is sheathed above the middle of the second node. Ligule subtruncate, narrow, scarious, denticulate. *Panicle* narrow, contracted, densely flowered; rachis glabrous. *Rays* branching, some shorter, and spiculiferous from their base, others longer and spiculiferous from their middle, scabrid; pedicels pubescent, not equalling or slightly surpassing the spikelets. *Spikelets* lanceolate, compressed; *glumes* equilong, acute, 1-nerved, lightly carinate, scarcely scaberulous, 1-flowered; flower shorter than the glumes; *floriglume* acute, entire or scarcely bidentate, 3-nerved, dorsally scabrous, basally surrounded by villosity fully as long as itself, having a subapical awn as long as itself and longer than the empty glumes; the very slender produced rachilla half as long as the flower and softly villous especially at its apex.

Chubut, in elevated meadows near Rio Carren-leofú; a grass 35–50 cm. high.

10. C. NEGLECTA Gaertn. (*C. stricta* Beauv.)

Creeping; *culm* simple, strict, glabrous, 45–60 cm. tall. *Leaves* linear, acuminate, plane, convolute when dry, rough-edged, ligule exserted, obtuse. *Panicle* narrow, spreading, 10–20 cm. long; *glumes* equal, oblong, acute, equalling the flower; *palea* half as long as the floral glume. *Awn* inserted below the middle, as long as the glume.

(N. Amer. and Eur.) S. Patagon. in Valley of Rio Gallegos; and N. and E. Fuegia (Dusén). (Fig. in Brit. & Br. i, 165.)

11. C. POÆOIDES Steud.

Culm 45 cm. tall, smooth, simple, or branched below. *Leaves* convolute, the sheaths long, striate. *Panicle* somewhat spike-like, lobed, 7 cm. long, the rays short, few-flowered. *Spikelets* dense, 2 mm. long, bluish; the *glumes* subequal, ovate-lanceolate, exceeding the flower, with tufts of shorter hairs; floral glume *short-awned*, as long as the palea.

Magell.; Fuegia; S. Patagon. by Rivers Gallegos and Sta. Cruz.

"Handsome, but my (Fuegian) specimens have a small truncate, not ovate, ligule." (Speg.)

12. C. SUKA Speg.

Cespitose, glabrous. *Culms* 5–10 cm. tall. *Leaves* plicate, much shorter than the culm, which is sheathed to its middle; ligule rather long, truncate, pectinate. *Panicle* narrow, lax, secund, the rachis glabrous, the rays branching, slender. *Spikelets* lanceolate, compressed; *glumes* equal, 3–3.5 mm. long, scabrid-margined and nerved; floral glume awned, the *awn* as long as the glume; flower with dense villi.

Fuegia (Brecknock Pen.); Navarino I.

24. HOLCUS Linn.

Spikelets crowded in an open *panicle*, with two flowers, the lower perfect and awnless, the upper staminate, with a stout bent dorsal *awn*.

H. LANATUS Linn. Velvet-grass.

Soft, downy, pale, 30–60 cm. tall, the panicle 5–10 cm., pale-reddish; second glume awned.

(Eur., N. Amer.) Magellan (Dusén).

25. ERIACHNE R. Br.

Leaves convolute-terete, rarely plane. *Panicle* dense or lax. *Spikelets* equally 2-flowered. *Glumes* 4, 2 of them empty, many-nerved, keeled, acute, subequal; 2 floral glumes equal, fewer-nerved, dorsally ciliate, *awnless* or *straight-awned*, at length indurated with the enclosed *palea* around the free grain; palea 2-toothed or 2-awned.

Species 22, chiefly Australian; some in tropical Asia.

E. MALOUINENSIS Steud.

Culm divided from the base, ascending, 12 cm. high. Basal *leaves* fasciculate, convolute, one third as high as the culm; culm-leaves only 6 mm. beyond their sheaths. *Panicle* simple, the rays 1-flowered. *Glumes* ovate-obtuse, yellow-white and purple.

Magellan; Falklands.

26. AIROPSIS Desv.

Low annuals with nearly subulate *leaves* and a narrow *panicle* of subequal, 2-flowered globose *spikelets*, having a very short rachilla continuing the pedicel. *Empty glumes* 2, obtuse, awnless; *floral glumes* 2, slightly shorter, at length rigid and enclosing the grains.

Species 2; one in W. Eur. and N. W. Afr.

A. MILLEGRANA Gris. (*Eragrostis airoides* Nees.)

Culm strict, simple; *sheaths* hairy-margined; *leaves* convolute, smooth. *Panicle* long, spreading, its rays semiverticillate. *Spikelets* shorter than the pedicels, oblong. *Floral glume* shortly serrulate, as long as the flowers.

(Brazil); N. Patagon.

27. AIRA Linn. Hair-grass.

Mostly annuals with narrow *leaves* and contracted or open *panicles* having capillary *rays*. *Spikelets* small, 2-flowered. *Glumes* 4, hyaline; 2 empty, subequal, acute, persistent; also 2 floral glumes, deciduous, dorsally *awned* below the middle; palea a little shorter. *Grain* enclosed in the glume and palea.

Species 6, in Eur. and N. Afr.; one in all temperate lands.

(Forms having the rachilla produced are removed to *Deschampsia*.)

1. A. ATROPURPUREA Wahlenb. (Scheele sub *Deschampsia*).
(*A. magellanica* Hook. f.)

Cespitose, erect, 20 cm. tall. *Leaves* plane, puberulous above; ligule ovate, truncate, toothed. *Panicle* lax, 7 cm. long, its branches paired, slender, apically spiculiferous. *Spikelets* 4 mm. long, 2-flowered; *glumes* ovate-lanceolate, acute, purplish or green at the base; *flowers* shorter, the lower subsessile. *Floral glume* long, truncate, silky at base, ciliate-toothed, *awned* above the middle, the awn straight and included. (Fig. 36.)

(Lapland; Arctic Amer.) Magellan, Puerto del Hombre.

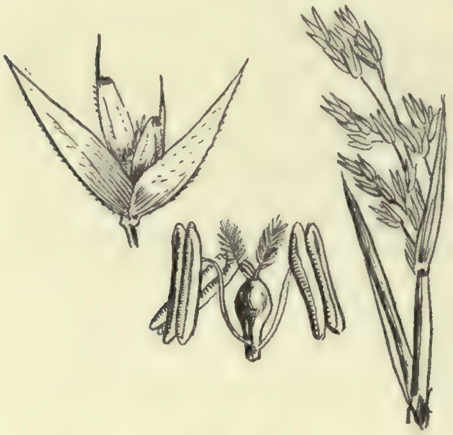

Fig. 36.

Aira atropurpurea. Inflorescence; spikelet and essential organs.

2. A. CARYOPHYLLEA Linn. Silvery Hair-grass.

Slender, cespitose, glabrous, 10–20 cm. tall, with silvery lax *panicle* having its rays in 2's or 3's. Ligules 3 mm. long; *leaf-blades* 1–3 cm. long, soft, narrow, soon twisting. *Spikelets* erect, silvery; *glumes* 2–3 mm. long, ovate, acute, 1-nerved; floral glume shorter, with projecting dorsal *awn.*

(Eur., naturalized in N. Amer. Fig. in Brit. & Br. i, 168.)

Falkland Is., introduced.

3. A. SPICIFORMIS Steud.

Cespitose and smooth; *culms* erect, 10–15 cm. tall. *Ligule* hyaline, oblong. *Panicle* contracted, spike-like or oblong, 25–35 mm. long; the rays short, few-spiculate; the spikelets violet and green, 2-flowered. *Glumes* not equalling the flowers, glabrous; floral glume ovate, incompletely 3-nerved. Palea ovate, its margin ciliolate.

Magellan; W. Fuegia.

"Very beautiful. My specimens differ from the type, having the color not or scarcely glaucescent, panicle linear, lower valvule 5-nerved." (Speg.)

4. A. SUPERBIENS Steud.

Cespitose; *culms* erect, pale-stramineous, 30–60 cm. tall, rough above. *Sheaths* lax, often purplish; *ligule* hyaline, acute; *leaf-blades* linear-lanceolate, 12–25 mm. long, pungent. *Panicle* spike-like, the rays in 3's and

5's, few-spiculate. *Glumes* ovate-lanceolate, subequal, not as long as the *awnless* flowers; *floral glume* woolly-ciliate. One *flower* usually viviparous, colored amethyst.

Magellan.

5. A. VESTITA Steud.

Cespitose, fertile and sterile intermixed with dry sheaths. *Fertile culms* 30 cm. tall. Radical *leaves* narrow-convolute, half as high as the culm. *Panicle* contracted, 5 cm. long, its rays naked at their base, 2–3 times forking. *Spikelets* silvery to yellow; *glumes* ovate, nearly equalling the flowers; these surrounded by basal cilia. *Floral glume* awned at base, the *awn* not twisted.

Magellan.

28. DESCHAMPSIA Beauv.

Panicle contracted or lax, the *spikelets* usually 2-flowered, and with the rachilla hairy-prolonged or bearing an additional staminate flower. The 2 *empty glumes* keeled, subacute; the floral glumes truncate, toothed, dorsally *awned* about the middle; *palea* narrow. *Awns* mostly keeled (straight in sect. *Campella*).

Species 20, in cold and temperate regions. Like *Aira*, but distinguished by the produced rachilla, or floral rudiment, by longer spikelets, and somewhat stouter habit.

KEY TO THE SPECIES.

A. Panicle lax.

b. Cespitose. Floriglumes awned.

c. Low, 5 cm., leafy, the leaves subulate, linear, involute. Straight basal awn. Extra rudiment. *antarctica.*

c2. Leaves convolute-setaceous. Spikelets 5 mm., violaceous. Awn protruding.

d. Culm 20 cm. Panicle dense. Awn 3 mm. *martini.*

d2. Culm 50 cm., nearly naked. Awn basal. No rudiment. Rays in 2's. *flexuosa.*

b2. Erect, 60 cm. Leaves linear, with long ligules. Rays fasciculate. Spikelets 6 mm.; mid-dorsal awn as long as floriglume. *grandiflora.*

A2. Panicle depauperate.

b. Awnless. Rays in 2's to 5's. Culm erect, 75 cm. Leaves short, scabrid. Glumes purple and gold. Long infrafloral stipe. *pulchra.*

b2. Awned. Rays in 2's. Glumes violet.

c. Culm slender, naked upwards; its one leaf convolute-filiform. Floriglume 4 mm., with long jointed awn. *tenella.*

c2. Culm 30 cm. Leaves few, flat, short. Spikelets 4 mm. Floriglume and its dorsal awn only 2 mm. *brachyphylla.*

*A*3. Panicle contracted.
  b. Leaves acicular, short, few. Panicle long-linear. Rays in 2's. Glumes violet. *aciphylla.*
  *b*2. Leaves filiform. Panicle weak, rays flexuose. Spikelets large, violet; flowers whitish. Awn geniculate. *discolor.*
  *b*3. Leaves setaceous.
    c. Culms 10 cm., leafy. Panicle few-flowered. Floriglume bifid. Awn geniculate. *parvula.*
    *c*2. Culm 20 cm., sheathed at base. Rays in 2's. Spikelets 10, 4 mm. long, purplish. Awn basal, long. *fuegiana.*

1. D. ACIPHYLLA (Franch.) Speg.

Cespitose. *Culms* 30 cm. tall, slender, smooth. *Leaves* acicular, many times shorter than the culms, only 1–2 on the culm; ligules lanceolate. *Panicle* long-linear, with paired, scaberulous, capillary rays, these erect along the axis. *Lower glumes* violet; flowers not exceeding the glumes; the lower sessile, the upper on the bearded axis surrounded by hairs.

Magellan; Fuegia. (*D. tenella* Phil. differs only by larger stature and habit.)

D. ACIPHYLLA PUMILA (Franch.).

Only 7 cm. high; *panicle* short.

The type and the var. both at Punta Arenas.

2. D. ANTARCTICA (Hook. f. sub *Aira*). (*Airidium elegantulum* Steud.)

Low, cespitose, 2–7 cm., leafy; the *leaves* with long sheaths, subulate-linear, involute. *Panicle* large, 10–15 cm. long, effuse. *Spikelets* lanceolate, 1–2-flowered, with rudiment of a third. *Glumes* lanceolate, rough-keeled, exceeding the flowers; floral glume deeply cleft, with a straight basal *awn.* (Fig. 37.)

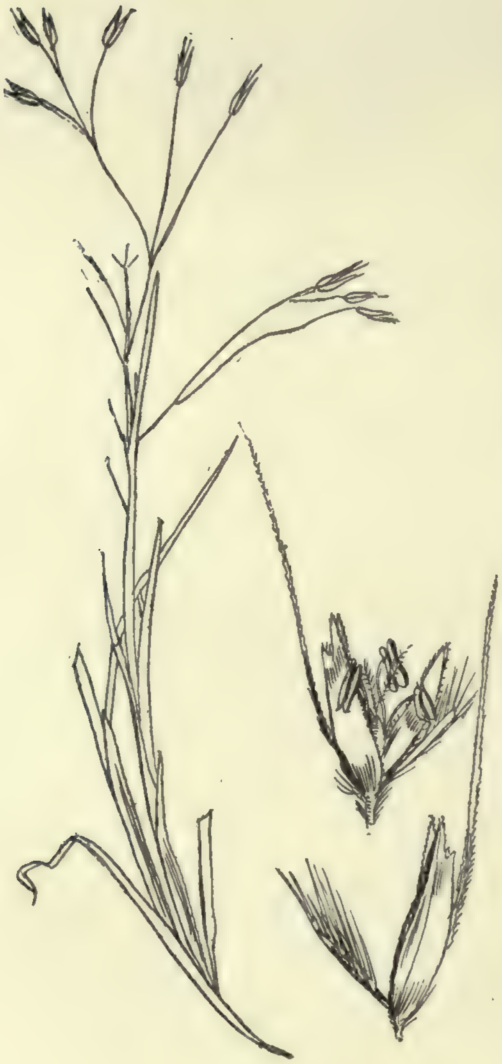

FIG. 37.

Deschampsia antarctica. The plant slightly reduced, showing its panicle; also a spikelet magnified and floral glume with rudiment.

(Mendoza); Magellan; Fuegia, Punta Anegada; Falklands (also in Kerguelen I., South Shetlands and South Georgia).

3. D. BRACHYPHYLLA Phil.

Culm 30 cm. tall, naked upwards, few-leaved, glabrous. Leaves plane, short, their ligules long. *Panicle* 10 cm. long, depauperate, 2 rays in the semiwhorls; *spikelets* about 10, subsessile, 4 mm. long. *Glumes* violet, their margin tawny; *floral glume* half as long, the dorsal *awn* its own length; the floral hairs shorter.

W. Patagon., Valley of Rio Palena.

4. D. DISCOLOR (Thuill. sub *Aira*) R. & S.

Culm erect; radical *leaves* long, almost filiform; ligule very acuminate. *Panicle* weak, contracted, its rays capillary, flexuose. *Spikelets* rather large; *glumes* violet, equalling the white, geniculately *awned* flowers.

(N. and Central Eur., N. Chili.) Fuegia.

5. D. FLEXUOSA (L.) Trin. (*Aira f.*)

Cespitose; *culms* 50 cm. high, nearly naked; *leaves* convolute, setaceous. *Panicle* spreading, rays capillary in pairs, spiculate at apex. *Spikelets* 5 mm. long; *glumes* scarious, violet towards base, equalling the flowers, the second slightly longer than the first. Pedicel of the upper flower short, pilose. *Awn* of floral glumes arising low and protruding from the spikelet.

(Eur., N. Asia; Greenland; N. Amer.) S. Patagon.; Magell.; Fuegia; Falklands. (Brit. & Br., i, 170.) "Common everywhere by sea-coast and on mountains of Fuegia." (Speg.)

6. D. FUEGIANA Phil.

Subcespitose, glabrous; *culms* 22 cm. high, densely sheathed at base. *Leaves* convolute-setaceous. *Panicle* 6 cm. long, contracted, rays 2 in the semiwhorls, these naked below, 10-spiculate. *Spikelets* 4 mm. long, purple, tawny-hyaline at top. *Floral glume* glabrous at base, not cleft, its *awn* basal, exceeding the palea.

E. Fuegia.

7. D. GRANDIFLORA (Nees). (*Aira grandiflora.*)

Culm erect, 60 cm. tall; *leaves* linear, striate, smooth, shorter than the culm, the lower complicate; ligules long, bifid. *Panicle* lax, spreading, its rays fasciculate, smooth; its rachis pilose-hoary. *Spikelets* 6 mm. long, smooth. *Floral glume* 4-toothed, its *awn* mid-dorsal, equalling its own length.

(Chili); Fuegia.

8. D. KINGII (Hook. f.). (*Aira kingii.*)

Tall, 60–120 cm., glabrous; *culms* cespitose, with 2–3 nodes. *Leaves* narrow-linear, striate, their margin involute; ligules oblong, scarious-white. *Panicle* long, lax, the rays whorled. *Glumes* white, lanceolate, 3 times as long as the flowers; *floral glumes* silky-bearded at base, truncate, 3-nerved, the mid-nerve produced as a straight *awn*. (*Trisetum dozei* Franch. is probably the same, fide Speg.) (Fig. 38.)

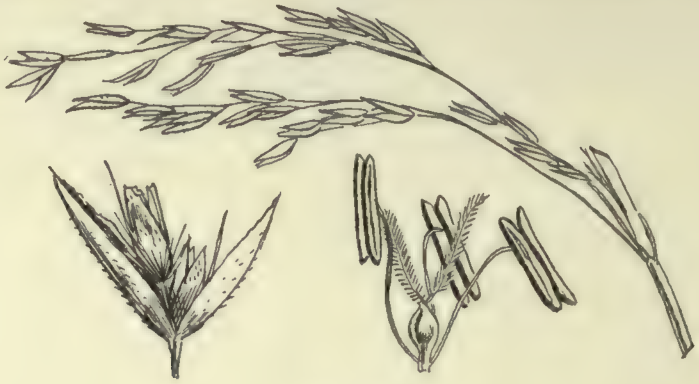

FIG. 38.

Deschampsia kingii. Panicle, reduced; also enlarged spikelet and essential organs.

Magellan; W. Patagon.; Fuegia, everywhere in elevated meadows.

9. D. MARTINI Phil.

Cespitose, glabrous, 20 cm. high; *leaves* convolute-setaceous. *Panicle* many-flowered, ovate or pyramidal, rather compact, 6 cm. long, 3–5 rays in semiwhorls. *Spikelets* fully 5 mm. long, on short pedicels. *Glumes* violet at their base; rachis glabrous; *floral glume* 4-toothed, its *awn* flexuous, exserted 3 mm.; palea as long.

Falklands.

10. D. PARVULA (Hook. f.). (*Aira parvula.*)

Cespitose; *culms* erect, 7–12 cm. high, often divided, leafy. *Leaves* shorter, setaceous; ligules long, scarious-tipped. *Panicle* contracted, few-flowered, its rays short and spikelets erect. *Glumes* lanceolate, acuminate, 3 times as long as the flowers; *floral glume* broad-ovate, basi-bearded, apically bifid between 2-toothed segments, awned dorsally, the *awn* jointed.

Patagon.; Fuegia; Cape Horn.

11. D. PULCHRA Nees & Mey.

Culm erect, 60–90 cm. high. *Leaves* short, 5 cm. long, convolute, scabrid. *Sheaths* striate, smooth; ligules long, acute. *Panicles* with 2–5 slender branches. *Spikelets* variegated, white-purple and gold. *Glumes* subequal, as long as the flowers. *Stipe* of the upper flowers usually half as long as the flowers, pilose. *Floral glume* with praemorsely toothed apex, *scarcely awned.*

(Chili); Patagon.

12. D. TENELLA Phil.

Culm slender, naked upwards; upper *leaf* convolute-filiform. *Panicle* 10 cm. long, 2 rays in each semiverticil. *Glumes* cuspidate, entire at apex, violet at base; *floral glume* 4 mm. long, 4-toothed, its *awn* geniculate, twice as long as the palea.

W. Patagon., Valley of Rio Palena.

29. TRISETUM Pers. False-oat.

Leaves flat; *panicle* dense or lax. *Spikelets* 2 rarely 3–6-flowered, the rachilla produced as a hairy bristle or an imperfect flower. *Glumes* keeled, the lowest 2 empty and unequal; the *floral glume* thinner, acute or bifid, with a dorsal *awn*, which is usually bent and twisted; palea narrow.

Species 50, in temperate regions by the Mediterr., many in N. Amer., also in Chili. 1 each in S. Afr., Madagascar, Himal., the Orient, and N. Zeal.

KEY TO THE SPECIES.

A. Spikelets 2-flowered.
  b. Panicle in a spathe, or protruding. Leaves lanceolate. Awn twice as long as its floriglume. (One of the flowers of a spikelet is easily lost.) *fraudulentum.*
  b2. Panicle lax.
    c. Panicle large. Leaves broad, long-sheathing. Floriglume 3–4-toothed; awn straight, not long. *dozei.*
    c2. Panicle broad, dense, short. Floriglume 2-aciculate, awned. *aureum.*
A2. Spikelets 2–3-flowered.
  b. Panicle lax, long, nodding, its rays fasciculate. Leaves linear. Spikelets 6 mm. long. Awn bent. *cernuum.*

b2. Panicle spike-like.

c. Tufted, 40 cm. Leaves linear-lanceolate, velvety. Spikelets silvery or purplish. Floriglume bifid, with short awn. *spicatum.*

c2. Erect, 25 cm., and sterile culms. Leaves flat, hairy. Spikelets 5 mm. long, with extra rudiment, variegated. Floriglume long, awned. *subaristatum.*

A3. Spikelets 3–4-flowered. Panicle spike-like.

b. Creeping. Culms 70 cm. Leaves scabrid inside. Spikelets 4 mm. Floriglume 5-nerved, scabrid, awned or awnless. *repens magellanicum.*

b2. Erect, 40 mm. Leaves linear-acuminate, with scabrous margin. Spikelets 5–7 mm. long. Floriglume 2-mucronulate, awn as long as itself. *variabile.*

1. T. ANTARCTICUM Trin. (non Nees).

Erect, glabrous. Lowest node hairy. Sheaths and *leaves* 10–15 cm. long, narrow-linear, scabrid on edges, otherwise glabrous. *Panicle* 7–10 cm., contracted to lax. *Spikelets* about 4-flowered, 7 mm. long. *Empty glumes* unequal, the lower narrow, the upper ovate-acute. *Floral glume* glabrous, 6 mm. long, acute, 2-mucronulate, awned two thirds up, *awn* its own length. Palea shorter.

(Chili; N. Zealand); Patagon. and Fuegia. (Speg.)

2. T. AUREUM Tenore. (*T. condensatum* Presl.)

Panicle broad, rather dense, short. *Spikelets* 2-flowered, the upper glume a little larger. *Floral glume* 2-aciculate, awned above the middle. Ovary naked. Callus naked. *Rachis* with very short hairs.

Fuegia.

3. T. CERNUUM Trin.

Culm slender, 70 cm. tall. Sheaths smooth or hairy, *leaf-blades* about 17 cm. by 7 mm. *Panicle* open, slender, nodding, 20 cm. long, its rays in clusters, capillary. *Spikelets* usually 2–3-flowered, 6 mm. long; *empty glumes* 3 and 4 mm. long; *floral glume* scabrous, ovate-lanceolate, its *awn* bent. *Grain* with hairy tip.

(Arctic Russia, there with glabrous grain; Japan; Calif.); Fuegia.

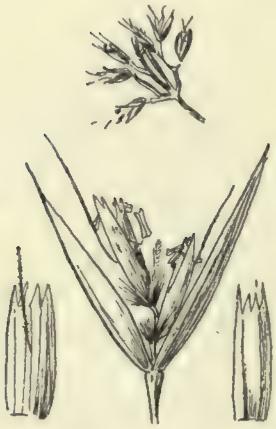

FIG. 39.

Trisetum dozei. Panicle, and enlarged spikelet, and floral glumes. (After Franchet.)

4. T. DOZEI Franchet. (May be *Deschampsia kingii* Hook. f.)

Cespitose; *culms* smooth, 30–90 cm. tall. *Leaves* broad, folded, long-sheathing. *Panicle* large, its rays smooth, elongate. *Glumes* lanceolate, the lower longer and 3-nerved. *Flowers* 2, enclosed in hairs, not exceeding the glumes. Rachilla rough, produced. *Floral glume* 3–4-toothed, with straight submedian *awn* not exceeding the glumes. (Fig. 39.)

Patagon., Churucca; Fuegia to Cape Horn.

5. T. FRAUDULENTUM Steud.

Glabrous throughout; *culm* 90 cm. tall; *leaves* lanceolate, their sheaths lax, shorter than the internode, ligules exserted, oblong, cleft. *Panicle* in upper spathe-like leaf, sometimes protruding. *Spikelets* 2-flowered; the *glumes* unequal, the lower ovate, twice as long as the lanceolate upper. The upper flower with hairy pedicel. *Awn* twice as long as its glume.

(The pediceled flower is easily deciduous, leaving its pedicel as in *Calamagrostis.*)

S. Patagon., by Rivers Gallegos and Sta. Cruz; Magellan.

6. T. REPENS (L.) MAGELLANICUM Desv. (*T. glaucum* d'Urv.)

Creeping. *Culms* 49–90 cm. long. Ligules short, toothed; *leaves* plane or convolute, scabrid inside. *Panicle* spike-like, 8–15 cm., green *Spikelets* erect, lax, oblong-elliptical, compressed, 12–16 mm. long, 3–4-. flowered. *Empty glumes* subequal, as long as the spikelet, oblong-elliptical, convex, 4–6-nerved, muticous or mucronate, inequilateral, erose-toothed, scabrid outside. *Floral glume* 5-nerved, oblong-elliptical, awned or not, dorsally scabrid.

Magellan; Port Gallaret: Puerto del Hombre. Ushuaia. Falklands.

T. SECUNDUM Kth. Mts. of Fuegia.

7. T. SPICATUM Richter. (*Aira* s̀. of L. *T. subspicatum* Beauv.)

Tufted, 10–60 cm. high; sheaths pubescent, 3 cm. long, ligules scarious, blades flat. *Panicle* spike-like, interrupted, silvery or purplish, 3–10 cm. long. *Spikelets* flattened, 2–3-flowered, produced rachilla as a bristle or a glume. *Empty glumes* about 5 mm. long, sublanceolate; *floral glume* as long, its awn varying in length.

(Fig. in Brit. & Br. i, 171. Eurasia by Arctic regions to N. Amer. and to Andes of Peru; also in Australia, N. Zeal., Campbell's I.) Falklands; Magell., Fuegia to Cape Horn.

"Its great abundance in the New World, and especially in the extreme south of America, coupled with its rarity in the southern regions of the

Old World, where it is only known on the tops of Campbell's Id., seems to indicate its having been transmitted from east to west as against the course of the prevailing winds in the antarctic regions." (J. D. Hooker.)

T. SPICATUM PHLEOIDES (Kunth).

A robust form.

Punta Arenas, and nearly everywhere in Fuegia (Dusén). Also a slender form at Ushuaia and Navarino I.

"That of Horn Id. is velvety throughout, and represents *T. phleoides* Kunth." (Franchet.)

8. T. SUBARISTATUM Desv.

Erect, 22–30 cm. *Leaves* 4–7 cm. long, plane, pubescent-tomentose. Ligule ovate, dentate-ciliate; sheaths longer. *Sterile culms* low. *Panicle* 5 cm. long, cylindraceous, spike-like, shining, variegated. *Spikelets* 2–3-flowered, with a pilose rudiment, 4–5 mm. long. *Glumes* unequal, the lower lanceolate, 1-nerved; the upper larger, obovate, 3-nerved; pedicels pilose. *Floral glume* glabrous, long, 5-nerved, *awned* below the apex.

S. Patagon., by Rio Sta. Cruz, rare.

9. T. VARIABILE E. Desv.

Culm erect, 30–60 cm. tall, with 2–3 glabrous nodes. *Leaves* plane, linear, acuminate, scabrous-margined. *Panicle* spike-like, 7 cm. long, shining. *Spikelets* 5–7 cm. long, shining, 3–4-flowered. *Flowers* 5–6 mm. long. *Glumes* unequal, the lower narrow, linear, the upper ovate, acute, shorter than the spikelet. *Floral glume* 5 mm. long, rough, 2-mucronulate, *awned* two thirds up; awn as long. Palea scarcely as long.

(Chili); Magellan; Fuegia (Brecknock Pen.).

T. VARIABILE VIRESCENS (Nees).

Leaves pilose, broad and rough (7 mm. by 30 cm. long); *ovary* glabrous. *Spikelets* about 3-flowered, glaucous to green.

(Central and S. Chili); Magell., Fuegia.

30. AVENA Linn. Oat.

Spikelets few-flowered, rarely 1-flowered, in a loose panicle; rachilla articulate above the two empty glumes, hairy under the floral glumes. *Empty glumes* subequal; the floral smaller, rounded on back, with a dorsal twisted *awn; palea* narrow. *Grain* furrowed, mostly pubescent, often adhering to the palea. Upper flower often imperfect.

Species 30, chiefly in temperate parts of the Old World.

1. A. FATUA Linn.

Culm erect, glabrous, smooth. *Leaves* broad, scabrid, aculeolate. *Panicle* equal, erect, its rachis scabrid. *Spikelets* oblong, 3-flowered. Flowers all *awned*, pilose at base with rufescent hairs. *Seeds* soon caducous.

(Europe, in fields); S. Patagon., in elevated meadows by Rio Sta. Cruz.

2. A. HIRSUTA Roth.

Culm half to more than one meter high. *Leaves* plane, scabrid. Ligules ovate, rounded. *Panicle* simple or compound, nodding. *Spikelet* 3-flowered, having (1) an inferior, fertile long-awned flower, (2) a muticous fertile flower, (3) an upper abortive muticous flower. *Glumes* lance-acuminate, 7–9-nerved, exceeding the flowers.

S. Patagon., by Rio Sta. Cruz.

3. A. LEPTOSTACHYS Hook. f.

Culm 30 cm. tall, slender. *Leaves* flat, long, shining. *Panicle* slender, flexuous, nodding, its branches whorled, short, capillary and few-flowered. *Floral glume* bearded below, bicuspidate, awned between the segments, the *awn* reflexed, twice as long as the spikelet. An elegant grass.

Magellan.

31. DANTHONIA DC.

Mostly perennials with flat or convolute *leaves* and contracted or open *panicles*. *Spikelets* 3–many-flowered, rachilla pubescent, extending beyond the 3–more flowers of the spikelet. *Empty glumes* subequal, keeled. *Floral glumes* rounded on back, 2-toothed, with a flat, twisted and bent median *awn*, the teeth sometimes awn-like. *Grain* free, enclosed in the glume.

Species 100, mostly in S. Afr. and in warm and temperate regions. (*D. antarctica* Desv. = *Deschampsia antarctica.*)

1. D. COLLINA Phil.

Culms erect, glabrous, 3-nodal. *Leaves* and sheaths long-pilose, the radical convolute, setaceous, one third as long as the culm; sheaths of the cauline leaves long, pilose-mouthed; upper ligules long; uppermost leaves short. *Panicle* contracted; spikelets 10–15. *Glumes* subequal, lanceolate-subulate, exceeding the flowers, yellow or slightly violaceous. *Floriglume* 10 mm., parted half-way, with long white hairs. *Awn* 12 mm.

Patagonia, elevated places near Bolson and Carren-leofú.

The Patagonian forms have the leaves and sheaths becoming glabrate with age, when young laxly and softly villous.

2. D. PICTA Nees & Mey.

Cespitose; *culms* erect, 6–30 cm. high, geniculate at the oblong, fulvous nodes. *Leaves* coriaceous, convolute, with pilose sheaths and short ligules. *Panicle* few-flowered, strict, to 4 cm. long, pointed: *spikelets* 9–10 mm., 3–4-flowered. *Empty glumes* lance-linear, 3-nerved, white with purple tips. *Floral glume* oval-elliptical, with setæ and *awn* in a triple cincture of hairs.

(Chili); S. Patagon., by R. Sta. Cruz, and Lago Argentino.

"Specimens from Sta. Cruz have yellowish-green glumes: from Lago Argentino are painted purple or violet." (Speg.)

3. D. PICTA PATAGONICA Speg.

Smaller than the species; *leaves* convolute-subulate, subpungent. *Spikelets* 3-flowered, *glumes* green, scarcely violascent; *awns* scarcely as long as their glumes.

S. Patagon., dry rocky places between S. Julian and Rio Deseado.

32. SPARTINA Schreb. Marsh-grass.

Glabrous with long rhizomes, flat, involute *leaves*, and alternate 1-sided *spikes*. *Spikelets* 1-flowered, in two rows, articulated below the glumes. The 2 empty glumes unequal, keeled; palea mostly longer than the floral glume.

Species 7, in saline soil or marshes.

1. S. CILIATA Kunth.

Leaves convolute-filiform. *Spikes* numerous, closely appressed. Keels of the *glumes* ciliate; *keel* of floral glume spinulose.

A tall wiry grass used for thatching about Bahia Blanca.

N. Patagon. (J. Ball).

2. S. DENSIFLORA Brongn.

Spikes cylindrical, subfusiform. Branches on all sides imbricate, appressed. *Spikelets* lanceolate, coriaceous, glabrous, lucid. *Keels* denticulate.

(Chili); Patagon.

3. S. PATAGONICA Speg.

Densely cespitose, glabrous. *Culms* leafy to the top. *Leaves* distichous, erect, their limb short, convolute, obtusely acute; sheath very long, close; ligule very short, ciliolate. *Spikes* secund, laterally compressed; rachis glabrous, dorsally channeled, with 8–12 spikelets, which are distichously unilateral, compressed and imbricate. *Lower glume* 2–3 times shorter than the upper, and narrower; the upper equalling the flower; palea glabrous, the inner finely membranaceous.

S. Patagon., at mouth of Rio Sta. Cruz. 40–70 cm. high.

33. CAPRIOLA Adans. (*Cynodon* Pers.)

Perennial grasses with short flat *leaves*, and *flowers* in digitately arranged *spikes*. *Spikelets* 1-flowered, secund. *Glumes* 3, the floriglume broadest and compressed; *palea* shorter, 2-keeled. *Stamens* 3; *styles* distinct. *Grain* free.

Species 4, 3 Australian, and 1 cosmopolitan in warm countries.

C. DACTYLON (Linn.) O. Ktze. Bermuda-grass.

Culms 1–3 dm. tall, erect, glabrous; *sheaths* crowded at base or on the stolons. *Leaves* flat, rough on upper surface. *Spikes* 4–5, rachis flat. *Floriglume* broad and much compressed.

(Eur., U. S. from N. Y. southwards.) N. Patagon., near Rio Colorado.

34. CHLORIS Swartz.

Leaves flat; *spikes* 1–many, often in pairs or digitate; *spikelets* in 2 rows on one side of the rachis, articulated above the empty glumes, which are unequal, keeled, acute; *floral glumes* awned, the lowest enclosing a perfect flower, at length enclosing the free grain. (Fig. in Brit. & Br. i, 178.)

1. C. PETRÆA Thurb.

Culm simple, erect, 30–60 cm. tall, glabrous, leafless. *Leaves* subdistichous, linear, serrulate, ciliate, their sheaths equitant, compressed.

Spikes 4–7, fasciculate, strict. *Flowers* 2, the upper setigerous below the apex; *floral glume* setigerous, ciliolate.

(Trop. Amer.); N. Patagon.

2. C. RADIATA Sw. (*C. beyrichiana* Kth.)

Culm creeping, branching, compressed; *leaves* scabrous, margined. *Spikes* 6–8, digitate, rachides flattish. *Spikelets* 2-flowered, the upper flower degenerate, 1-awned. The *glumes* lance-subulate; floral glumes long-awned.

(Trop. Amer.); N. Patagon.

35. TRICHLORIS Fourn.

Tall perennials with flat leaves. Spikes numerous, slender, sessile on the peduncle, subverticillate, forming a dense panicle, which is oblong and echinate by very many dense awns. Spikelets slender, erect, 1-, rarely 2-flowered, sessile along the continuous rachis of the unilateral spikes, 2-seriately crowded; rachilla articulated above the lower glumes, produced beyond the flower and glumiferous. Empty glumes 2, small, the second awned; the floriglume 3-awned, its awns long, straight. Superior empty glumes various, some 3-awned, others reduced.

Species 4–5, Mexico to S. Amer.

a. Flower of spikelet 1, hermaphrodite, and 2 or 1 sterile flowers. Awns of fertile floral glume 3, subequal.

  b. Neuter flowers 2. *mendocina* (type).

  b2. Neuter flower 1. *mendocina blanchardiana.*

a2. 2 flowers of spike hermaphrodite, and 3 sterile; mid awn larger. *pluriflora*, of Texas, Mex., Argentina.

T. MENDOCINA BLANCHARDIANA (Gay) Kurtz. (Scribner's description of *T. blanchardiana.*)

Culm stout, leafy, 60 cm. tall. Sheaths compressed, keeled, hairy on edges, especially near the throat; upper surface of the conduplicate leaf hairy near the base. Spikes slender, 12 or more, 7–10 cm. long, in a terminal panicle. Spikes 1-flowered, flower 3-awned, hermaphrodite; also a stiped 3-awned rudiment, occasionally 2 rudiments.

N. Patagon. Common by RR. Colorado and Negro.

36. BOUTELOUA Lag.

Spikes 1-sided, ultimately drooping. Spikelets in 2 rows on the rachis, 1–2-flowered, the rachilla prolonged, bearing bristles or rudimentary flowers. The 2 lower empty glumes acute, keeled; the floral glume 3-toothed; palea narrow, entire or 2-toothed; stamens reddish. Upper empty glumes 3–5-awned or divided. Grain oblong, enclosed but free.

Species 30, chiefly in Mex. and S. W. United States.

B. oligostachya (Nutt.) Torr. is the Grama-grass of U. S. prairies; *B. hirsuta* Lag., hairy Mesquite-grass.

B. MEGAPOTAMICA (Spr.) O. Ktze. (*B. multiseta* Gris.)

Cespitose; culms creeping, ascending, jointed, simple, 30 cm. tall. Leaves linear, narrowing subulate at top, the margins rough, glaucous above; their sheaths cleft, glabrous, and ligules short ciliate. Spikes 3–4, racemose. Spikelets 4–5-flowered, silky at base; lower flower 3-awned, densely pilose; the others with one glume and 9–11 fascicled awns.

(Brazil; Argentina.) N. Patagon. along Rio Negro, near Carmen.

37. TETRAPOGON Desf. (*Cryptochloris* Benth.)

Small grasses, with dense simple *spike* half enclosed within a spathe-like *bract*. *Spikelets* with 1–2–3 flowers, silky. *Lower glumes* very narrow, acute, awnless; several upper empty glumes smaller and awned; *floral glume* awned, the *awn* terminal between 2 obtuse lobes, mostly silky. Floral glume and grain falling away together.

Species 6, chiefly African; 1 in Patagon.

T. SPATHACEUS (Benth.).

Annual grass, scarcely 5 cm. high; *stems* below the inflorescence, 12–25 mm. *Leaves* few, laxly sheathing, the blades linear. *Bract* large, spathe-like, 16–20 mm. long, nearly enclosing the sessile, continuous, subsecund *spike*, which is quasi-plumose from the *setæ* and *awns* of the 2-flowered, biseriately crowded *spikelets*.

S. Patagon., by Rio Sta. Cruz. "My specimens hardly differ from the description by the palea being awnless and attenuate-mucronate." (Speg.)

38. PAPPOPHORUM Schreb.

Cespitose grass, with narrow, often convolute *leaves*, and dense spiciform *panicle*, with many *awns* often silk-like. *Spikelets* 1–2-, rarely 3–4-

flowered, narrow, with a joint above the lower glumes, the uppermost flower often male. *Empty glumes* 2, carinate; *floriglume* broad at base, obscurely many-nerved, divided into many *awn-like lobes;* 2–3 upper glumes empty or with a rudiment. *Palea* broad, 2-carinate. Grain enclosed in the palea and floriglume, free.

Species 20, in warm countries.

P. MUCRONULATUM Nees.

Culm branching. *Leaves* attenuate-acuminate, convolute, glabrous as are the sheaths. *Panicle* spicate, narrow, long, cernuous; *spikelets* nearly 4-flowered. *Glumes* subequal, oblong, membranaceous, setaceous-mucronate, 1-nerved; 2 (rarely 3) lower flowers perfect. *Floriglume* subcoriaceous, silky-strigose, 4-cleft.

(Brazil); N. Patagon., not rare in dry places near Carmen, and at the mouths of Rio Negro.

39. PHRAGMITES Trin. (*Arundo* Beauv.)

Tall perennials, with large flat *blades*, and spikelets 2–many-flowered, in a large much-branched *panicle*, *rachilla* elongated and articulate between the flowers, and covered with long hairs. *Glumes* thin, keeled, pointed, the *floriglume* with a longer point, the *lowest flower* being male or abortive. (This last character distinguishes from *Arundo* Linn.)

Species 2, over warmer parts of both worlds, in wet places.

P. PHRAGMITES (Linn.) Karst.

Culms 2–3 m. high; *blades* often 3 cm. wide. *Panicle* 15–35 cm. long. *Spikelets* 3–5-flowered, 16 mm. long, the silky hairs as long as the flowers. *Glumes* with nerves anastomosing towards the apex. *Floriglume* 5-nerved, 12 mm. long.

(Cosmopolitan in N. Hemisphere and Australia); Chubut, in swamps, and near Carren-leofú. The Patagonian forms always have 3-flowered spikelets, the upper flower often reduced.

40. MONANTHOCHLOË Engelm.

Creeping or stoloniferous, with crowded distichous *leaves*, less than 1 cm. long. *Spikelets* unisexual, almost immersed in leafy bracts. *Empty glumes* like the leaves. *Floriglume* obtuse or toothed. *Stamens* 3.

Styles distinct. *Grain* subtriquetrous, enclosed in the palea, not adherent. Species about 2, in southern U. S. and S. Amer.

M. AUSTRALIS Speg.

Densely pulvinate-cespitose; the short branches pectinately leafy. *Leaves* small, complicate, rigid, callous-pointed. *Spikes* acrogenous, subsessile, compressed; with 2, rarely 3 flowers; often with a produced glumiferous rachilla; *floriglume* subcarinate; *palea* bicarinate, all glabrous. (Only the male specimens known.)

S. Patagon., dry salinas between S. Julian and Rio Deseado.

41. GYNERIUM Humb. & Bonpl. Pampas-grass. (*Cortaderia* Stapf.)

Tall, tubular grasses, often with *woody base. Leaves* very long, narrow, crowded at the base; ligules a line of hairs. *Panicle* ample, dense, becoming lax and nodding, silvery or dark. *Spikelets* 3–7-flowered, diœcious, *rachilla* longish, articulate in both sexes, with long hairs arising from the membranaceous or thin narrow *glumes. Empty glumes* as long as the spikelet, scarcely equal, 1–3-nerved or nearly nerveless, acuminate. *Floral glumes* 3-nerved, the mid pointed and produced as an *awn*, mostly glabrous in the male, long-pilose in the female. *Stamens* 3 in the male flowers, also rudiments in the female, and rudimentary ovary in the males. *Grain* narrowly oblong, free within the glume and palea.

Species 5, in extratrop. S. Am. and along the Andes northwards.

1. G. ARGENTEUM Nees. (*Cortaderia dioica* Speg.) Pampas-grass.

3–6 m. tall. *Leaves* 1–3 m., gracefully pendent. *Panicles* 30–60 cm. long, 10–15 cm. broad, the *males* broad-pyramidal, the *females* long-linear, beautifully silvery or pinkish. *Floral glumes* of the male flowers scarcely awned. (Fig. in Eng. & Pr. ii, 2, p. 67.)

(Cult. in lawns; Brazil; Argent.); N. Patagon., Patagon., near source of Rio Chico; Nahual-huapi.

2. G. PILOSUM (d'Urv. sub *Arundo Cortaderia pilosa* Hack.).

Panicle contracted, subovate. *Empty glumes* smooth, carinate, acute, as long as the spikelet. *Floral glumes* copiously girt with long, white villi. *Leaves* striate, distichous, mostly exceeding the culm. *Panicle* contracted, subovate. *Glumes* violaceous, scarious-margined. *Empty* *glumes* smooth, carinate, acute, as long as the 5-flowered spikelet. *Floral glumes* smooth with long, white villi.

This with *Sieglingia antarctica* and *Festuca erecta* make a cespitose and tenaceous mass, 3 dm. deep, covering half of the Falkland Islands. Patagonia, by Lago Maravilla.

"Rachilla pilose." (F. Kurtz.)

42. SIEGLINGIA Bernh. (*Triodia* R. Br.)

Leaves narrow, and *panicles* contracted or open. *Spikelets* having 2 to several flowers, all perfect or the upper staminate. *Glumes* 5–many, the lowest 2 empty, shorter than the spikelets, keeled; the *floral glumes* not keeled, their 3 nerves pilose and excurrent as points. *Styles* short. *Grain* dorsally compressed, enclosed but free.

Species 30, in temperate regions; also in trop. Amer., Afr. and Austral.

S. ANTARCTICA (Hook. f.).

Small, densely cespitose, very leafy, glabrous; *leaves* not rigid, nearly equalling the culm, long-sheathed, setaceous, the margins involute. *Panicle* spike-like; *spikelets* short-pediceled, 3-flowered; glumes subequal, lanceolate; *floral glume* broad-ovate, 5-nerved, acute, minutely *trifid*. See note on *Gynerium pilosum*.

Magell., Fuegia, Mts. of Hermite I., Falkland Is.

43. DIPLACHNE Beauv. (or sub *Leptochloa*).

Cespitose, mostly tall, with narrow, plane *leaves*, and very slender *spikes*, erect on a long axis, or rarely 1 terminal spike. *Spikelets* mostly linear along the rachis, erect, subsecund, many-flowered, sessile or nearly so, their rachilla articulate above the lower glumes. *Flowers* hermaphrodite, or the uppermost male. *Empty glumes* 2, carinate, unequal, 1-nerved, not awned. *Floral glume* slightly larger, 1–3-nerved, 2-toothed, with a short median *awn*. *Grain* enclosed but free.

Species 14, in warm climates.

D. MENDOCINA (Phil. sub. *Ipnum*).

Panicled spikes numerous, spreading with an open angle. *Spikelets* many-flowered, distichous along the rachis. *Rachilla* articulate between the flowers. Lower *empty glume* lanceolate, upper ovate, larger. *Floral* *glume* dorsally compressed, 3-nerved, shortly mucronate, hyaline towards its apex. *Palea* ovate.

(Argentina); Patagon.

44. ERAGROSTIS Beauv.

Spikelets flat, usually many-flowered (rarely 2-flowered), the *flowers* perfect or variously unisexual; *panicle* contracted or open. *Glumes* short, unequal, keeled, 1–3-nerved; *floral glumes* larger, unawned, 3-nerved; palea shorter, prominently 2-nerved. *Stamens* 2 or 3. *Grain* not furrowed, enclosed, free. (Like *Poa*, but differing by the 3-nerved floral glumes.)

Species 100, in temperate and warm climates.

1. E. DELICATULA Trin.

Culm erect, slender, 12–25 cm. tall, floriferous and branching from base. *Leaves* plane, glabrous, their ligules ciliate-bearded. *Panicle* spreading, its rays 1–2, rarely more, mostly compound from the base. *Spikelets* as long as the pedicels, linear-elliptical, 3–6-flowered.

(Bahia Blanca); N. Patagon. "Good pasture in the valleys." (J. Ball.)

2. E. ERAGROSTIS (Linn. sub *Poa*) Karst.

Annual, 10–25 cm. high. *Leaves* flat, smooth, scent-glands on their margins and the glumes. *Panicle* ovoid or linear, rather dense. *Spikelets* compressed, on short pedicels, oblong-linear, plumbeous, 8–20-flowered. *Floriglume* broad-oval, obtuse; *palea* ciliated on the nerves. *Grain* ovoid.

(Europe, introduced to Amer.); N. Patagon. in cultivated places near Carmen.

3. E. LUGENS Nees.

Tufted perennial, 45 cm. high. *Sheaths* of sterile sheets compressed, keeled, hairy. *Ligule* a ciliate ring; blades ciliate, with filiform points. *Panicle* thin, narrow or ovoid, 30 cm. long. Rays in 2's or 4's, with hairy axils, branching. *Spikelets* oval, 4–8-flowered. *Glumes* ovate, acute, floriglume broader, *palea* incurved.

(Texas, etc.); N. Patagon., common near Carmen.

4. E. MAJOR Host. (*E. poœoides major* Beauv.)

Cespitose, branching, 15–60 cm. tall. *Leaves* lanceolate, glabrous, their sheaths bearded at the opening. *Panicle* spreading, the rays solitary or in pairs. *Spikelets* elliptic-linear, large, 8–50-flowered; the *flowers* broad-ovate, mostly mucronulate. (Leaf-nerves with glands which emit an offensive odor.)

(Cosmopolitan); a dwarf form in N. Patagon.

45. KOELERIA Pers.

Cespitose, with contracted *panicles*. *Spikelets* mostly 2–5-flowered. The two lower *empty glumes* keeled, acute or short-awned, scarious-margined; *floral glumes* similar but more scarious; the upper glumes gradually smaller, 3–5-nerved.

Species 15, dispersed over temperate regions; several species in Chili and Argent. Distinguished chiefly by more scarious glumes and fainter nerves than of their allies.

1. K. PHLEOIDES Pers.

Culm ascending, geniculate, 7–30 cm. high. *Leaves* plane, narrow, linear, hairy; ligule white-scarious, partly exsert, lacerous. *Panicle* dense, cylindrical, spike-like; *spikelets* 2–8-flowered. *Glumes* unequal, shorter than the flowers. *Floriglume* dorsally scabrous, subapically awned; the *awn* exceeding the flower. Annual.

N. Patagon., roadsides near Carmen.

2. K. STERILIS Steud.

Culms 5–15 cm. high, with the leaves fasciculately crowded, having basal sheaths. *Leaves* glabrous, linear, nearly as long as the culms, the margin inflected; the ligules oblong, exsert. *Spike* terminal, solitary; the rays with 2–6 *spikelets*, which are lanceolate, 3–4-flowered. *Glumes* subequal, nearly as long as the flowers, white hyaline on margin and apex.

Patagon.

46. CATABROSA Beauv. Whorl-grass.

Creeping perennial aquatic, with soft flat *leaves* and open *panicle*. *Spikelets* 2-flowered, the two empty *glumes* nearly nerveless, shorter than the *awnless*, erose-truncate floral-glume; palea barely shorter.

Species 1, viz.:

C. AQUATICA Beauv.

Culm 10–60 cm. tall, stout. *Spikelets* 3 mm. long, the second empty glume exceeding the first. (Brit. & Br. i, 194. In cold parts of Eurasia and N. Amer.) E. Fuegia.

47. MELICA Linn.

Erect perennials, often with corms, and usually soft flat *leaves*. *Panicle* contracted or lax; *spikelets* 2–several-flowered; their rachilla produced and bearing rudimentary flowers. *Empty glumes* 2, awnless, 3–5- or more-nerved; *flowering-glumes* larger, rounded, 7–13-nerved, sometimes terminally awned. *Paleæ* broad but shorter. *Grain* oblong, dorsally flattened, enclosed but free.

Species 30, in temperate regions (not known in Austral.).

1. M. MACRA Nees.

Erect, over 60 cm. tall, slender; *leaves* strict, very rough, the lower linear-plicate, the upper plane, 12 cm. by 2 mm. *Panicle* compound, secund, its rays racemose. *Spikelet* 3-flowered, lanceolate, nodding. *Glumes* subequal, oblong, convolute, 5- and 7-nerved.

(Montevideo and about Bahia Blanca; the *pasto-bravo*, or wicked grass. J. Ball.) N. Patagon.

(*M. magellanica* Desv. ⟹ *Hierochloë redolens.*)

2. M. PAPILIONACEA Linn.

Panicle virgate. Pedicels slender, branching below, longer than the spikelets. *Lower glume* very large, colored, obovate, obtuse, much exceeding the upper. *Flowers* 2 and a rudiment; *floral glume* oblong, 16-nerved, apex scarious-colored.

(Brazil); N. Patagon.

3. M. VIOLACEA Cav.

Rhizome bulbiferous. *Culms* flagelliform, branching, 15–60 cm. tall. *Panicle* linear, rigid, 5–20 cm. long, with 1–7 unilateral appressed branches; *spikelets* 2-flowered with 1 or 2 imperfect flowers. Lowest *glume* the largest, obovate-rounded, 8–10 mm. long, violet, apex whitish; the upper shorter and narrow.

(Common about Bahia Blanca.) N. Patagon. "*Nahuel-Catschu*, the Araucanian name, refers to the puma crouching in it." (J. Ball.)

48. DISTICHLIS Raf.

Creeping grass with rigid convolute *leaves* and diœcious *flowers;* mostly maritime. *Spikelets* compressed, 6–16-flowered, in a narrow *panicle*, sometimes with only 2 or 3 spikelets. *Rachilla* glabrous, articulate between the female flowers only. *Glumes* all keeled and acute; the floral broadest; *palea* with prominent keels.

Species 4, America; 1 of them also in Australia.

1. D. SCOPARIA (Kunth, sub *Poa*) Arech.

Culms fasciculately branching, the branches subfastigiate, leafy. *Leaves* narrowly linear, convolute-setaceous, acute-pungent, rigid, with glabrous sheaths. *Female spikelets* 3–5, branching, oblong, acute, compressed, 5–6-flowered, glabrous. Flowers not bearded. *Floral glume* about 1-nerved.

(Montevideo); S. Patagon., by Rio Chico.

2. D. SPICATA (Linn.) Greene.

Glabrous, 60 cm. tall. *Sheaths* long, overlapping; ligules a ring of hairs. *Panicle* dense, strict. Much varying.

(N. Amer. and S. Amer.; also Austral. Brit. & Br. i, 198.) N. Patagon., on sandy and saline soil. "Granilla de salistral." (J. Ball.)

D. SPICATA HIRTA (Phil.) O. Ktze.

Hairy, at least the lower leaf-sheaths.

Patagonia.

49. BRIZA Linn.

Panicle usually open. *Leaves* flat or convolute. *Spikelets* large, flat, tumid, usually many-flowered, nodding. *Glumes* strongly concave. *Floral glumes* broader; uppermost often empty. *Paleæ* much shorter.

Species 12, Old World, and temperate S. Amer.

1. B. SUBARISTATA Lam. (*B. lamarckiana* Nees. *Festuca commersonii* Spreng.)

Like *B. triloba*, but taller, 22 cm., and with orbiculate-cuspidate *floral glume*. *Spikelets* elliptic-ovate, about 11-flowered. *Panicles* erect, 25 mm. long, contracted; its rays sub-binate, 1-spiculate.

(Montevideo); N. Patagon. (?)

2. B. TRILOBA (Nees).

(*Calotheca*, *glumes* awned, *floral glumes* with projecting lateral angles.) *Culm* low, about 15 cm., simple. *Leaves* erect, convolute, rough; ligules short. *Panicle* rather contracted, its rays 3-parted. *Spikelets* subtetragonal, 6–12-flowered. *Floral glumes* 3-lobed, the mid-lobe long, 9-nerved. (Brazil); N. Patagon.

50. PANICULARIA Fabr. (*Glyceria* R. Br.)

Leaves flat or involute, and *panicle* narrow or spreading. *Spikelets* few- or many-flowered; the *empty glumes* 3–5-nerved; the *floral glumes* 3–9-nerved, longer, obtuse, convex or dorsally flat, the nerves short; *palea* as long as its glume; no awns. Grain grooved, glabrous, enclosed but free. Leaves mostly glabrous (except *P. fluitans*).

Species 30, in temperate and some warm regions. *P. fluitans* R. Br. extends through the N. temperate parts of both hemispheres, and Australia. (Brit. & Br. i, 213.)

1. P. ANTARCTICA (Speg.).

Creeping, glabrous. *Culms* sheathed above the mud, the sheaths loose. *Leaves* few, plane, the lower floating, the ligules long-triangular. *Panicle* exsert, very lax; the rays whorled, remote, bearing few spikelets; these ovate, 2-flowered, compressed; lower *glume* half as long as the upper. Base of flower with a few long hairs.

Staaten I. and S. Fuegia.

2. P. FLUITANS (L.) Kúntze. Floating Manna-grass.

Culms a meter high or more, flattened, stout. *Sheaths* loose. *Leaves* 12–30 cm. long, wide, scabrous, often floating. *Panicle* about 30 cm. long, rather appressed. *Spikelets* linear, 7–13-flowered; *glumes* unequal, 1-nerved; the *floriglume* scabrous, 7-nerved, its apex erose.

(Eur. and N. Amer. by water); Patagon., by Lago Colu-huapi and Rio Carren-leofú.

3. P. FUEGIANA (Speg.).

Creeping, glabrous; *culms* sheathed to top, the sheaths large, striate; *leaves* few, flaccid, erect, the lower sometimes floating; their blades plane, linear, acute; ligules exsert, ovate, toothed. *Panicle* long, exserted from the sheath, at first linear, afterwards lax; *spikelets* remote, peduncled, linear, 3-flowered; *glumes* glabrous, the lower obtuse, the upper acute and twice as long.

Magellan, by fresh water, near Gregory Bay.

4. P. LEPTOSTACHYS (Speg.).

Small, cespitose, glabrous. *Culms* not sheathed, simple. *Leaves* fasciculate, erect, very short, the ligules lanceolate. *Spike* linear, few-spiculate; *spikelets* minute, remote, sessile, 3-flowered. *Glumes* unequal.

Magell.

5. P. MAGELLANICA (Hook. f.).

Glabrous, with *culm* erect and covered by the leaf sheaths, which are longer than the involute leaf blades. *Panicle* long, lax; its rays in flower apically elongated. Spikelets 4–6-flowered; *glumes* apically eroded; *floral glumes* 5-nerved.

S. Patagon., by R. Sta. Cruz; Magell., in wet meadows by Gregory Bay.

51. ATROPIS Ruprecht.

Panicle at length contracted. *Spikelets* 2–9-flowered. *Empty glumes* 3-nerved, or the first 1-nerved, much shorter than the flowers; *floral glumes* chartaceous or scarious, convex or slightly keeled, obscurely parallel 5-nerved, midnerve sometimes produced, the side nerves short; *palea* with convergent ciliolate nerves, 2-toothed. *Stigmas* subsessile. *Grain* obcompressed, enclosed but free.

Species 14, in all temperate regions.

1. A. CARINATA Griseb.

Cespitose, glabrous, 10 cm. high. *Leaves* involute, acuminate, rigid, their sheath lax below, their ligules long. *Panicle* ovate-oblong, the rachis sulcate on one side. *Spikelets* oblong, 4–5-flowered; *floral glume* silky below, 2-toothed above with a median mucro.

(Paraguay; Argentina); N. Patagon.

2. A. MAGELLANICA Hook. f.

Glabrous, 30 cm. tall; *leaves* involute; ligules ovate-acute; sheaths lax. *Panicle* 15 cm. long, its rays long, slender. *Spikelets* oblong, 4–6-flowered, 8–12 mm. long, the *flowers* distant, cylindraceous; *floral glume* narrow, 4 mm. long, attenuate to an obtuse spike, glabrous except the pilose callus; *palea* as long.

"Differs from *A. parviflora* by *flowers* twice as large, *keels* of the palea spinulose, ciliate the whole way, *panicle* lax, branches naked in the lower two thirds, and its simple spiculiferous *branching*." (Dusén.)

E. Fuegia.

3. A. PARVIFLORA Hackel.

Cespitose; *culms* erect, 4–8 cm. high (besides the panicle), glabrous, having 1–2 nodes near the base. *Leaf-sheaths* lax, the upper one long, embracing the panicle; ligules 1.5 mm., linear-oblong; the *laminæ* short, 15–20 mm., convolute-setaceous. *Panicle* 8–10 cm. long, ovate, spreading, compound, the branches rough. *Spikelets* linear, 3–5-flowered, 5–6 mm. long; *empty glumes* unequal, ovate-oblong, obtuse; the lower 1-nerved, 1 mm. long, the upper 3-nerved and longer; *floral glume* 2 mm. long, 5-nerved. *Palea* as long, 2-toothed, the keels scabrid above.

E. Fuegia (Dusén).

4. A. PRESLII Hack. (*Catabrosa tenuifolia* Presl.)

Cespitose; *culms* erect, 10–12 cm. high, glabrous. *Leaves* narrow-linear, canaliculate, rough, shorter than the culm; ligule exsert, ovate, acute. *Panicle* spike-like, erect, its rays alternate, fasciculate, rough. *Spikelets* ovate, 3-flowered, *glumes* unequal, ovate, obtuse, the upper twice as large as the lower, and 3-nerved; the *floral glume* ovate-obtuse, erose, 5-nerved, the lateral nerves becoming obsolete.

(Chili.)

5. A. PRESLII PUSILLA Hack.

Forming dense *cushions* 3–4 cm. high. *Leaves* convolute, subcapillary, 1–2.5 cm. long. *Panicle* linear, 2–4 cm. long. *Spikelets* subterminal and subsessile on the ultimate branchlets, small, 3 mm. long, red-violet. *Empty glumes* small, the lower 0.8 mm. long, nerveless; the second twice as long, obscurely 1-nerved; the *floral glume* ovate, 1.5 mm. long, entire; *palea* as long, lanceolate.

N. and E. Fuegia (Dusén).

52. POA Linn. Meadow-grass.

Leaves and panicles various. *Spikelets* of medium size, usually 2–6-flowered, the *rachilla* glabrous and articulate between the floral glumes; *floral glumes* scarious margined, with 5-connivent nerves, mostly web-tufted at base. *Paleæ* slightly shorter.

Species 100, in temperate and cold regions; rare in the tropics; many in the Andes.

Key to the Species.

- *A.* Leaves glabrous.
  - *b.* Panicle contracted.
    - *c.* Leaves as long as the culm.
      - *d.* Culm tall, 1 meter. Sheaths long. Spikelets 6–8-flowered. Glumes woolly at base. *alopecurus.*
      - *d2.* Culm 80 cm. Leaves filiform. Spikelets 3-flowered. Glumes subvillous. *bonariensis.*
      - *d3.* Culm 30 cm., shorter than the convolute leaves. Ligules long; sheaths dilated. Awn short. *controversa.*
      - *d4.* Culms in clumps, 1 meter; lower leaves taller, subconvolute. Panicle spike-like. Spikelets 4-flowered. Floriglume bifid, mucronate-awned. *forsteri.*
    - *c2.* Leaves shorter than culms, sheaths overlapping Annuals or biennials, under 30 cm. Spikelets 3–7-flowered.
      - *d.* Cauline leaves 3, flat or conduplicate, abruptly acute; ligules 2.5 mm. Spikelets 3–7-flowered. *annua.*
      - *d2.* Leaves convolute. Ligules obsolete. Spikelets 5–7-flowered. *denudata.*
      - *d3.* Leaves convolute-pungent. Ligules short, obtuse. Panicles spike-like. Spikelets crowded above, 2–4-flowered, amethystine. *robusta.*
    - *c3.* Leaves distichous, linear, rigid; ligules short. Panicle lobed; spikelets 2–5-flowered, the staminal effete. Culm 20 cm. Flowers woolly at base. *lanigera.*
    - *c4.* Leaves narrow or involute, with two yellow spots; ligules oblong. Culms 30 cm., from a creeping base. Spikelets 5–10-flowered, with subfloral tufts. *lanuginosa.*
    - *c5.* Leaves short. Culms 15 cm.
      - *d.* Culm 2-nodal below, with intravaginal innovations. Ligules 2 mm. Spikelets 3-flowered. Glumes and floriglume subequal, keeled. *atropidiformis.*
      - *d2.* Culm basally bulbiferous. Ligules long. Panicle few-spicate. Spikelets 2–3-flowered. Palea cuspidate-awned. *ibari.*
    - *c6.* Leaves convolute, attenuate-pungent. Diœcious perennial. Spikelets 7–8-flowered, not villous. Culm 60 cm. *argentina.*
    - *c7.* As *c6*, but leaves pungent; floriglume woolly at base. *bergii.*
    - *c8.* Leaves short, stiff and pungent, mostly distichous. Culm smooth, erect, slender. Spikes strict, secund.
      - *d.* Leaves subterete. Spikelets 2-flowered, the upper flower male. *erinacea.*
      - *d2.* Leaves very conduplicate. Spikelets 2-flowered, both perfect, often with a rudiment of a third. *pugionifolia.*
    - *c9.* Leaves very long, acute, smooth. Panicle long, rays rough. Spikelets 12-flowered, pale yellow. Culm 60 cm. *pallens.*
  - *b2.* Panicle lax. Leaves sheathing; with long ligules.
    - *c.* Low, 6 cm. Leaves rigid, convolute. Spikelets few, 3-flowered. Glume and rachis glabrous. *pumila.*
    - *c2.* Culm 60 cm., sheathed half way. Leaves distichous. Spikelets 4–6-flowered, cottony. *yaganica.*
  - *b3.* Panicle lax. Culms 2–3 meters tall. Leaves fan-shaped, gracefully diverging. *flabellata.*

A2. Leaf-margins rough; surface smooth. Panicles lax.
b. Culms to 25 cm. Leaves convolute. Spikelets large, 4–5-flowered, purplish, enclosed by woolly hairs. *commersoni.*
b2. Culms to 50 cm. Radical leaves narrow-linear. Spikelets few, 2–5 (8)-flowered, rachis flexuose. *stenantha.*
A3. Leaves scaberulous or sometimes glabrous.
b. Panicle pyramidal, dense above. Spikelets 3–6-flowered, purplish. Floriglume basally webby. Culm 40 cm. *pratensis.*
b2. Panicle mostly lax, 4–5-spiculate. Glumes acuminate. Upper flowers viviparous. Culm 50 cm., leafy at base. *fuegiana.*
b3. Panicle mostly contracted. Culms 35 cm.
c. Spikelets small, woolly. Leaves few, setaceous-convolute, the sheaths scaberulous. Panicle linear. *scaberula.*
c2. Spikelets 3-flowered, diœcious. Leaves convolute, the lower flat (pubescent?). *chilensis.*
A4. Leaves scabrous. Culm 50 cm.
b. Panicle lax. Leaves acuminate. Spikelets 2–5-flowered, often violet. Floriglume basally webby. *nemoralis.*
b2. Panicle spike-like. Culm 3-nodal, exceeding the leaves. Leaves convolute, scabrous above. Ligules long, 2-partite. Spikelets long, 5–8-flowered *patagonica.*
A5. Leaves scabrid-edged, plicate, pungent. Diœcious, with large, secund panicle, and spikelets 2-flowered. *chubutensis.*

1. P. ALOPECURUS Kunth. (*Festuca arundo* Hook. f.)

Large, reaching a meter in height; *leaves* glabrous, distichous, equalling the culm; sheaths long. *Panicle* ample, contracted. *Spikelets* glabrous, compressed, 6–8-flowered; *glumes* minutely ciliate on back and margin, floral glumes acute, dorsally ciliate, woolly at base. *Palea* minute.

Magellan; Falklands. Next to the *tussock*, it is the largest grass there; varying much in size of the plant, and of its leaves, spikelets, etc. It is harsh and rigid, and thus unpalatable to cattle.

2. P. ANNUA Linn.

Low annual or biennial, under 30 cm. *Leaf-sheaths* loose, overlapping. Ligules 2–3 mm. *Panicle* open, its rays spreading. *Glume* no. 1 narrow, 1-nerved; two thirds as long as the broad 3-nerved second; the *floral glume* not webby at base.

(Brit. & Br. i, 201. Eurasia; naturalized in N. Amer.) Punta Arenas; Ushuaia (Dusén); over S. Patagon.; S. Fuegia.

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3. P. ARGENTINA Speg.

Diœcious, perennial, 50–70 cm. tall, glabrous, cespitose. *Leaves* erect, convolute, acute. *Ligule* narrow, margin-like. *Panicle* spiciform, strict. *Spikelets* 5–7 mm. long, pediceled, 7–8-flowered, not villous. *Glumes* appressed-pubescent.

S. Patagon., at Lago Argentino.

4. P. ATROPIDIFORMIS Hack.

Cespitose, with intravaginal innovations. *Culms* erect, 10–20 cm. high, smooth, 2-nodal near base. *Leaves* glabrous, their sheaths lax, striate; ligules 2 mm. long, ovate-lanceolate, the *blades* short, the uppermost 1 cm., narrow, convolute when dry. *Panicle* spike-like, 5–8 cm. long; lower rays with 4–6 spikelets, fewer above; *spikelets* 3-flowered, all perfect, glabrous, third flower protruding. *Glumes* all subequal, keel scabrid, except the floral glume whose keel is rather smooth and its lateral nerves obscure. *Palea* lanceolate, obtuse, as long as the glume.

E. Fuegia. (Dusén.) "This and *P. kerguelensis* Hook. f. and *Triodia antarctica* Hook. f. are allied as if they were a subgenus of *Poa*." (E. Hackel.)

5. P. BERGII Hieron.

Diœcious. Stout, *culms* 50 cm. high, smooth, rooting at base. *Leaves* exceeding the culms, their sheaths 20–25 cm. long, 7 mm. broad, smooth, *laminæ* 35–45 cm. long, convolute from their base, glaucous, rigid, acute, *pungent*, 4 mm. wide at base, dorsally glabrous, internally papillose; ligules long, hyaline, mostly lacerose. *Male panicle* compressed, spike-like, interrupted, 12 cm. long, the rays usually in 2's alternately appressed to the culm, pediceled and plurispiculate. *Female spikes* ovate, 6–7-flowered, pediceled, about 15 mm. long, 6 mm. broad. *Glumes* lanceolate, 8–9 mm. long, 3 mm. broad, acute, not exceeding the inferior flowers, subcarinate, dorsally rough on the midnerve, minutely ciliolate marginally, 7-nerved, the 2 marginal nerves being weaker and shorter than the others. *Floral glumes* 7–9-nerved, lance-ovate, acute, in the lower flowers 7 mm. by 2 mm., subcarinate baseward and finely ciliate on the nerves, with a basal girdle of floccose wool. *Paleæ* with 2 marginal nerves, ciliate upwards, woolly basewards. *Male* spikelets (?).

N. Patagon., by Rio Negro; December.

P. BERGII CHUBUTENSIS Speg.

Differs from the species by lower *stature*, 3-nerved *glumes*, 5(–7)-nerved *paleæ* and *spikelets* scarcely 9–11 mm. long.

N. Patagon., Chubut, common in dry meadows by Cabo Raso.

6. P. BONARIENSIS (Lam. sub *Festuca*) Kunth.

Culms slender, 60–90 cm. tall, weak, glabrous; *leaves* long, filiform, glaucescent, hairy at the opening of the sheaths. *Panicle* oblong, shining, its rays appressed. *Spikelets* compressed, 3-flowered; glumes acute, subvillous.

(Argentina); S. Patagon., N. and E. Fuegia. (Dusén.) In sandy places.

7. P. CHILENSIS Trin.

(*Dioicopoa. Diœcious*, but the sexes not otherwise differentiated.) *Root* fibrous, often stoloniferous. *Culm* 20–45 cm. tall. *Leaves* convolute, the lower plane, 25 cm., the ligules somewhat produced. *Panicle* compact or lobed, its rays in 3's or 5's, spiculiferous from the base. *Spikelets* 3-flowered, short-pediceled; *flowers* obscurely nerved, lanceolate, acutish. Puerto Madryn; (Chili).

8. P. CHUBUTENSIS Speg.

Diœcious. Robust, densely cespitose, green-glaucescent. *Leaves* plicate, with scabrid margins, callous-mucronate and pungent; ligules short, truncate, scarious. *Panicle* large, secund, at length nutant; rachis not scabrous; rays not scabrous, naked below, above their middle sparingly branching and densely spiculiferous. Pedicels short; *spikelets* 2-flowered, lanceolate; *glumes* obtusely keeled, not rough, 1- and 3-nerved. *Flowers* carinate, dorsally scabrid; lower floriglume 5-nerved, submucronate; *palea* as long, hyaline. *Squamulæ* rather large, basally villous, the upper with a short, smooth pedicel. (Only female specimens seen.)

Chubut, in rocky elevations near Teka-choique.

9. P. COMMERSONI Franchet.

Cespitose, glabrous. *Culms* to 30 cm. tall, erect, apex scabrid. *Leaves* convolute, strict, rough-margined, striate. Panicle crowded, oblong, with short rays. *Spikelets* large, purplish, 4–5-flowered; the flowers enclosed by long woolly hairs. Glumes subequal, ciliate, mucronate, the lower 5–7-nerved; the *floral glume* like the others; the *palea* short, truncate.

A fine species, like *P. antarctica* Hook., approaching *Festuca*.

Magellan, "Freshwater Bay, named by me Duclos Bay." (Commerson, 1767.)

10. P. CONTROVERSA Steud.

Cespitiferous. *Culm* erect, glabrous; *leaves* rigid, convolute, smooth, pungent, 30 cm. long, their sheaths dilated; ligules long, cleft. *Panicle* contracted, its rays subverticillate, many-spiculate. *Spikelets* ovate, 5-flowered, the flowers alternate, remote. *Glumes* lanceolate, scarcely equalling the first flower; *floral glume* 2-toothed with a short *awn* between.

Patagon. and Fuegia (Speg.); Falklands.

11. P. DENUDATA Steud.

Roots fibrous, cespitiferous. *Culms* erect, strict or basally jointed, smooth, striate, 30 cm. high, sheaths glabrous, striate. Ligule nearly wanting. *Leaves* terete-convolute, smooth, not exceeding the culm. *Panicle* very long-exserted, contracted, with semi-whorled rays, shorter at the base. *Spikelets* 5–7-flowered, flowers green to white, varied. *Glumes* ovate-lanceolate, equalling the lowest flowers. *Floral glume* acute with rough keel.

N. W. Patagon., Valdivia.

P. DENUDATA MINOR.

12. P. ERINACEA Speg.

Hermaphrodite or polygamous, densely cespitose; sterile and fertile *fascicles* often crowded and monostichously imbricated, all similar. *Leaves* mostly distichous, glabrous. Sheaths broad, close, minutely 2-auricled. *Laminæ* subterete, short, rigid, very sharply pungent-mucronate. *Culms* smooth, erect, slender, naked or 1-leaved. *Spike* strict, erect, secund, its nodes 2–3-pedicelliferous. *Pedicels* short, scabrid. *Spikelets* compressed, often 2-flowered, the lower flower perfect, the upper male, both glabrous; glumes awnless.

Chubut, in dry salinas. Forming hemispherical masses, 10–25 cm. diam.

13. P. FLABELLATA Hook. Tussock-grass. (*Dactylis cæs.* Forst., *Poa cæspitosa* H. nec Forst.)

Gigantic grasses with fan-shaped *leaves*, spreading out like young palm-trees. Fig. 40.

Falklands; Staaten I.; Magellan and Fuegia to Cape Horn; Elizabeth I.; Bonner Bay on Picton I., at entrance to Beagle Chan.; (also in Kerguelen I.).

Gregarious; valuable as fodder and forming peat; extending over long patches near the seashore in the Falkland Islands, where it is most abundant and luxuriant. Gov. Moody wrote of its "sweet nutty-flavored roots. Cattle scent it from a distance and use every effort to get at it. They will eat the dry tussock-thatch off the roof of a house in winter." "Strange that they flourished where there was no herbivorous animal to use them." Discovered by Commerson in 1767. American sealers lived on the nut-like core of the bases of their culms for 14 months.

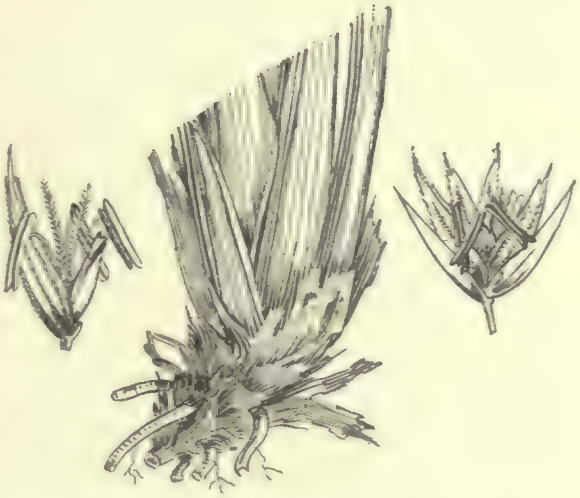

FIG. 40.

Poa flabellata, tussock-grass. Roots of leaves reduced, and spikelets. (After *Flora antarctica.*)

14. P. FORSTERI Steud.

Cespitiferous, in small clumps; *culms* numerous, to 1 meter high, glabrous, compressed, leafy; lower *leaves* higher than the culms, 25 mm. broad at base, upwards with involute margin; ligules slender, rounded. *Panicle* interrupted-spike-like, 15–20 cm. by 3–4 mm. *Spikelets* broad-ovate, 4-flowered; *glumes* lance-acuminate, longer than the flowers, the margins involute; *floral glume* bifid and mucronate-awned.

Magellan.

15. P. FUEGIANA (Hook. f. sub *Festuca*) Hack.

Culms erect, 50 cm. tall, leafy especially at base, scaberulous or glabrous. *Panicle* effuse or slightly contracted. *Glumes* ovate-lanceolate, acuminate, subcarinate, *floral glume* puberulous, dorsally silky on the nerves; *flowers* short-pedicelled, webby at base, the upper viviparous. *Palea* bifid, as long as its glume.

A very handsome species retained in *Festuca* by J. D. Hooker on account of its acuminate scales; but with "fertile glumes acutely carinate, silky-pubescent on the keel and at the prominent marginal nerves; just as in *Poa*." (Dusén.)

Magell.; Fuegia to Cape Horn; Sta. Cruz Valley. (J. B. Hatcher.)

16. P. IBARI Phil.

Cespitose, glabrous, bulbously thickened at base, covered by white sheaths of dead leaves. Fertile *culm* 15 cm. high; *leaves* coriaceous, convolute-setaceous, much shorter than the culm; the ligules very long. *Panicle* contracted, few-spiculate, 4 cm. long. *Spikelets* 9 mm. long, 2–3-flowered. *Floral glume* of male flowers 7.5 mm. long, 3-nerved at base, usually cuspidate awned, with scabrid keel, basally woolly as on lateral nerves. Joints of rachis penicillate at base.

By Lago Pinto, S. Patagon.

17. P. LANIGERA Nees.

Culm simple, scarcely 30 cm. high, with compressed, carinate, glabrous sheaths. Ligule short, rounded or truncate, *leaves* distichous, linear, rigid, plane. *Panicle* branching, contracted, lobed. *Spikelets* 2–5-flowered, all the staminal effete. *Flowers* very long-woolly at base. Lower *floral glume* 5-nerved, densely silky-ciliate on back and margin.

(Brazil; Chili); Patagon. (?).

18. P. LANUGINOSA Poir.

(*Dioicopoa* see *P. chilensis.*)

Creeping; culm simple, 30 cm. tall, with 2 nodes, subcompressed. *Leaves* narrow-linear, becoming involute, a yellow spot at each side near the glabrous sheath; the ligules oblong, lacerate. *Panicle* contracted, its short, solitary rays fasciculately divided. *Spikelets* ovate, 5–10-flowered, imbricate on the raylets; *floral glume* silky-keeled, with a tuft of long hairs on the axis under each flower.

S. Patagon. by R. Sta. Cruz; E. Fuegia. (Dusén.) "Identification uncertain; perhaps a var." (E. Hackel.) Chubut, "not rare in dry places by Cabo Raso," var. *elata* Speg.

19. P. MAGELLANICA Phil.

Female specimens in the Spegazzinian Herbarium are identical with *P. patagonica* Ph.

Magellan (Spegazzini); Fuegia.

20. P. NEMORALIS Linn.

Culms erect, 50 cm. tall, slender, glabrous. *Leaves* 7 cm. long, 2 mm. wide; their sheaths shorter than the internodes; ligules truncate. *Panicle* open, its rays erect or ascending. *Spikelets* 2–5-flowered, 3–5 mm. long; *floral glume* webby at base, the nerves silky below.

(Brit. & Br. i, 205. Eurasia and N. Amer. to Rocky Mts.) Magell.; E. Fuegia. (Dusén.)

21. P. PALLENS Poir.

Culm compressed, glabrous, smooth, 60 cm. high. *Leaves* narrow, acute, very long, smooth. *Panicles* 15–20 cm. long, the rays verticillate, numerous, very rough. Raylets filiform. *Spikelets* compressed (pale yellow), shining, about 12-flowered. *Floral glumes* acute, transparent, with membranous margin.

(Argentina); S. Patagon., by Rio Sta. Cruz.; Chubut, "more slender, elongate, the panicles more narrowly linear, elongate, erect and somewhat rigid." (Speg.)

22. P. PATAGONICA Ph.

(*Dioicopoa.*) Stoloniferous and glabrous, 30–60 cm. tall, with 3 nodes. *Leaves* convolute-filiform, coriaceous, scabrous-tipped, shorter than the culm; ligules long, 2-partite. *Panicle* 55–80 mm. long, spike-like, lobed, violet-yellow, the rays spiculiferous from the base or middle. *Spikelets* 8 mm. long, 5–8-flowered; *glumes* 4 mm.; *floral glume* as long, 5–7-nerved, glabrous; palea three fourths as long.

By S. Patagon.

23. P. PRATENSIS Linn.

Culms 60 cm. tall, smooth; *leaves* 10 cm. long by 1–6 mm. wide, basal leaves longer, their sheaths exceeding the internodes; ligules truncate, more than 1 mm. *Panicle* pyramidal, its rays ascending, dividing and spiculiferous above the middle. *Spikelets* 3–5-flowered, 4–5 mm. long, exceeding the pedicels. *Floral glumes* webbed at base, but naked between the nerves.

(Eurasia and N. Amer., also cult.)

Patagon., Chubut, and by Rio Sta. Cruz; Magellan, Falklands; E. and S. Fuegia.

P. PRATENSIS OLIGERIA (Steud.) in Magellan and Fuegia, having convolute rough leaves.

24. P. PUGIONIFOLIA Speg.

Hermaphrodite or polygamous, densely cespitose; sterile and fertile *fascicles* often densely and monostichously crowded on the stolons; all similar. *Leaves* generally distichous, glabrous; the sheaths very broad and close, apically subauriculate; the limbs spreading, very conduplicate, short and rigid, ending in a very acute pungent mucro. *Culms* smooth, erect, slender, simple, naked, or 1-leaved below. *Spike* strict, erect, secund, with 2–3-pedicilliferous nodes, the pedicels scabrid, short with lanceolate, compressed, mostly 2-flowered spikelets, the flowers glabrous, hermaphrodite, often a third flower being added at the top of the rachilla with a rudimentary floriglume.

S. Patagon., in rocks along Rio Chico, at Parr-aike; and Boron-aike by Rio Sehuen.

25. P. PUMILA Phil.

Cespitose. Culms 5–7 cm. high; *leaves* rigid, convolute when dry, the sheaths enclosing nearly the whole culm; ligules long. *Panicle* spreading, its branches paired, few-spiculate. *Spikelets* oblong, 3-flowered. *Glumes* and joints of rachis glabrous; *floral glume* acute.

Turf with culms enclosed by red-brown sheaths of old leaves; like *P. annua*, excepting the leaves.

Colorados, N. Patagon.

26. P. ROBUSTA Steud.

Glaucescent, rigid, erect, 15–30 cm. tall; sheathed by old leaves at base, rather distichously leaf-bearing, the sheaths dilated, ligules short, obtuse, *blades* channeled, convolute, pungent, much shorter than the culm. *Panicle* spike-like; its rays unequal, naked at their base, crowded spiculiferous upwards. *Spikelets* 2–4-flowered. *Glumes* subequal, ovate-lanceolate, shorter than the flowers; *floral glume* similar; *palea* narrower, ciliolate. Spikelets pale-amethyst.

S. Patagon., Punta Arenas; Coy Inlet. (Hatcher, Nov. 23, 1896.)

27. P. SCABERULA Hook. f.

Culm 30 cm. tall, slender, scabrid ("almost smooth," Franchet). *Leaves* few, 10 cm. long, setaceous-involute; sheaths long, scaberulous. *Panicle* dense, rather secund. *Spikelets* small; *glumes* subequal, 1-nerved, the *floral glume* 3-nerved, its keel scabrid above, ciliate below; flowers woolly. Patagon., Chubut; Port Eden; Magellan, E. Fuegia. (Dusén.) "The Chubut specimens are very slender, with long linear spikes." (Speg.)

28. P. STENANTHA Trin.

Culms 30–60 cm. tall. Radical *leaves* narrow-linear; culm-leaves 3–7 cm. by 2–4 mm., ciliate-scabrous on margin; ligules short, rounded. *Panicle* lax, 5–15 cm. long, naked below, few-spiculate above. *Spikelets* 2–5(8)-flowered; *flowers* 4–5 mm. long, rachis flexuous or zig-zag; *floral glume* linear-lanceolate, with infolded margin, its keel ciliate-scabrous.

(Siberia; Alaska; Oregon; Chili); Fuegia at Ushuaia.

29. P. YAGANICA Speg.

Cespitose, glabrous; *culms* 25–90 cm. tall, sheathed halfway or more; *leaves* distichous, plicate below, plane above, their ligules long-toothed. *Panicle* lax, its rays remote, paired, naked downwards; its *spikelets* lanceolate, compressed, 4–6-flowered. *Glumes*, the first acute, scabrid, carinate; the second glabrous; *floral glume* cottony at base.

S. Fuegia.

53. FESTUCA Linn.

Mostly tufted perennials, variously paniculate, with pedicellate 2–many-flowered *spikelets*. The 2 *empty glumes* narrow, unequal, acute, keeled; the first 1-nerved, the second 3-nerved; *floral glume* narrow, rounded on back below, acute, often keeled-awned, faintly 5-nerved; *palea* nearly as long, sharply 2-keeled. *Stamens* 1–3. *Styles* very short. *Grain* within the glume and palea, partly adhering. (Fig. 41.)

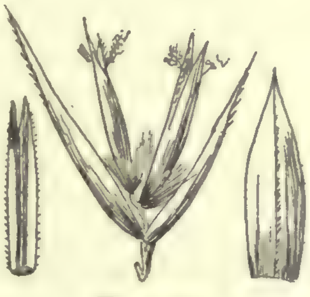

FIG. 41.

Festuca, spikelet, with floral glume on right, and palea on left. *F. pogonantha* (after Franchet).

Species 80, widespread, chiefly in temperate regions. (*F. kerguelensis* Hook. f. in Kerguelen I., and *F. scoparia* Hook. f. in N. Zeal. and Antarctic Islands. *F.*

cookii Hook. f. 1847 = *Poa cookii* Hook. f. 1879, is the commonest grass in Kerguelen I., affording excellent fodder.)

The chief mark of this genus is the rounded floral glumes without any prominent keel, at least at the base, and acute or awned at the top.

Key to the Species.

- *A*. Panicle lax.
  - *b*. Spikelets 2–3-flowered. Culm 50 cm., slender, exceeding the convolute leaves. Panicle cernuous, smooth. Glumes and floriglume subequal, awnless. *pogonantha.*
  - *b*2. Spikelets 3–4-flowered, some viviparous. Culm 50 cm., exceeding the rush-like, pungent leaves. Glumes scabrid, floriglume larger, setulose. *commersoni.*
  - *b*3. Spikelets 4–5-flowered, 10 mm. long. Culm tall, sheathed. Rays in 2's, capillary. Glumes unequal; floriglume 8 mm., short-awned. *glaucophylla.*
  - *b*4. Spikelets 5–7-flowered. Culms 45 cm., fertile and sterile; leaves narrow, puberulous. Raylets few-spiculate. Floriglumes 7-nerved, mucronulate. *lechleriana.*
  - *b*5. Spikelets about 8-flowered. Culms tall.
    - *c*. Culms slender, glabrous. Upper glume thrice as long as lower. Floriglume 5-nerved, awned. Leaves short, flat. *purpurascens.*
    - *c*2. Culms naked a long way. Floriglume 8 mm., cuspidate. Spikelets few, 18 mm. long, 8–10-flowered. *serranoi.*
  - *b*6. Spikelets large, 8–25 mm. long, often viviparous. Culm 45 cm.; leaves strict, short, ligules long. Floriglume acuminate, silky. *fuegiana.*
- *A*2. Panicle oblong-contracted. Floriglumes acute, awnless.
  - *b*. Leaf-blades long, smooth, 6–8 mm. broad. Spikelets 4–8-flowered, with woolly rachis. plant robust. *alopecurus.*
  - *b*2. Leaf-blades narrow-linear, rigid, acute. Spikelets compressed, patent. *antarctica.*
- *A*3. Panicle contracted, subsecund. Culms slender, 40 cm., tufted or creeping. Leaves one third as long. Spikelets 3–8-flowered; floriglume short-awned. Also sterile shoots. *ovina.*
- *A*4. Panicle racemose, secund.
  - *b*. Leaves narrow-linear; culm and sheaths glabrous. Rays alternate. Spikelets 5–9-flowered. Awns rough, exceeding the smooth floriglumes. *muralis.*
  - *b*2. Leaves convolute, with auriculate ligules. Culm 20 cm., basally jointed and sheathed, Glumes unequal, the lower setaceous. Flowers in 5's, long-awned. *myurus.*
  - *b*3. Leaves linear-setaceous; culm 25 cm. Panicle spike-like in upper part. Lower glume small. Awn twice as long as floriglume. *bromoides.*
- *A*5. Panicle long-racemose, not secund.
  - *b*. Leaves linear-filiform. Culm 1 meter, slender. Panicle inclined, few-spiculate. Spikelets 7–9-flowered. Awn short. *gracillima.*
  - *b*2. Leaves linear, with long ligules; culms thrice as long, 28 cm. Spikelets 4-flowered. Floriglume 1-nerved, keeled above, awnless. *patagonica.*
  - *b*3. Leaves flat, narrow, 1–4 cm. long; culm 25 cm., branching. Spikelets few, 2-flowered. Lower glume the longer. Floriglume 5-nerved, awnless. *biflora.*
- *A*6. Panicle strict, its rays paired or solitary. Leaves thickish, lanceolate, acuminate. Spikelets few, 7-flowered. Floriglume setulose. *platyphylla.*

A7. Panicle spike-like, afterwards spreading. Slender annual, 15 cm. tall, with convolute-setaceous leaves. Spikelets 4–5-flowered, at length awned. *eriolepis.*

A8. Panicle spicate. Plants glabrous.

- *b*. Awnless.
  - *c*. Leaves convolute, pungent, the lower spreading fan-like. Spikelets compressed, 3-flowered. *arenaria.*
  - *c2*. Leaves involute with long ligules, equalling the culm, 20 cm. Rays in 2's and 3's. Spikelets 4-flowered. *shuka.*
- *b2*. Short-awned. Leaves setaceous, pungent. Panicle secund, with rough rachis and floriglume. Spikelets 3–4-flowered. *erecta.*
- *b3*. Long-awned. Culm 25 cm.; leaves much shorter, subulate; ligules none, but sheaths auricled. Rays in 2's. Spikelets 3-flowered. *pyrogea.*

1. F. ALOPECURUS Schreb. (Kunth sub *Poa*).

Robust, 60–90 cm. tall; sheaths smooth, compressed, 30 cm. or more; *leaf-blades* long, smooth, 6–8 mm. broad; ligules ovate, 10 mm. long, *Panicle* contracted, oblong-elliptical, 12 cm. long, dense, shining. *Spikelets* (female) 4–8-flowered; the *glumes* oblong-lanceolate, scarcely as long as the flower; rachis long, woolly; *floral glume* apically attenuate, acute, keeled, ciliate on the 3–5 nerves; *palea* narrower, shorter.

(West Mediterr. region); widely spread from Entrerios to N. Patagon., "fueo-catschu." (J. Ball.)

2. F. ANTARCTICA Kunth.

Leaves erect, long-sheathing, narrow-linear, rigid, acute. *Panicle* contracted, oblong, interrupted at base. *Spikelets* compressed, spreading; fascicles of hairs rare, short; *floral glume* acute. Several varieties arise from differences of size, and of pilosity of flowers. Possibly it is the same species as *F. arundo* (*Poa alopecurus*).

Falklands, abundant; Fuegia, Good-success Bay.

3. F. ARENARIA Lamk.

Glabrous; *culms* compressed, slender. *Leaves* convolute, pungent, the lower equal and spreading, fan-like, the upper short. *Panicle* spike-like, its rays distant, fastigiate. *Spikelets* compressed, about 3-flowered; the *glumes* equal; *floral glume* awnless.

Magellan; Falklands; Fuegia to near Cape Horn. "Floral glumes often notched on each side, as in *Dactylis*. Fuegian specimens often viviparous."

4. F. ARUNDO Hook. f. (*Poa alopecurus* Kunth.)

5. F. BIFLORA Steud.

Culm branching at the base, thin, glabrous, not 30 cm. high; with sterile branches in dry sheaths; culm-sheaths green, ligules oblong, 2 mm., *leaf-blades* flat, narrow, 1–4 cm. long, 0.5 mm. wide. *Panicle* very narrow, racemose; the rays solitary, 1–3-spiculate; the *spikelets* lanceolate, 2-flowered. *Glumes* shorter than the flowers, the lower one the longer. *Floral glume* 5-nerved, obtuse or subacute. *Grain* obscurely trigonal.

Patagon., by saline lakes.

6. F. BROMOIDES Linn.

Culm 15–30 cm. high; the *leaves* linear-setaceous, complicate. *Panicle* secund, spicate upward. The *glumes* unequal, lanceolate, acuminate, the upper 3-nerved, as long as the lower flower; the lower 1-nerved, one third as long. *Floral glume* scabrous towards the point, its *awn* twice as long as its flower.

(Eur.) Falklands, near the settlements, as if introduced.

7. F. COMMERSONI Franchet.

Cespitose, glabrous, glaucous. *Culms* smooth, slender, erect, 50 cm. tall; *leaves* shorter, rush-like, rigid, pungent. *Panicle* short, its lower rays long, spreading. *Spikelets* 3–4-flowered, mostly viviparous. *Glumes* purplish, ovate-lanceolate, scabrid, margin ciliate; *floral glume* larger, setulose. Palea ciliate-keeled.

Magellan, Churucca; Fuegia, Beagle Channel, and near Cape Horn; W. Patagon. (Dusén.)

F. COMMERSONI VIVIPARA.

W. part of Magellan Str. (Dusén.)

8. F. ERECTA d'Urville.

Leaves setaceous, erect, glabrous, slightly pungent (9 cm.), as long as the subspicate, secund *panicle.* Rachis very rough, *spikelets* oblong-lanceolate, 3–4-flowered; *flowers* erect, approximate; *glumes* unequal; *floral glume* rough, shortly awned.

Fuegia to Hermite I.; Falklands. (See note on *Gynerium pilosum*, p. 213.)

F. ERECTA CIRROSA Speg.

Leaves coarse and rigid, cirrose or subcircinate.

Fuegia, Puerto Roca.

9. F. ERIOLEPIS Desv.

Slender, cespitose annual, 10–20 cm. high, branching at the base. *Leaves* convolute, setaceous. Ligules very short, 2-auricled. *Panicle* 25–50 mm., somewhat spiciform, erect, spreading in anthesis. *Spikelets* 4–5-flowered. *Glumes* unequal, the lower linear, 1-nerved, acute; the next broader, 3-nerved, longer. *Floral glume* with rigid, spinose hairs, at length awned. *Stamen* 1.

(Chili.)

F. ERIOLEPIS NANA Hier.

Culms 3–7 cm. tall. Leaves 15–20 mm. long. Panicle spike-like, 10–15 mm. long.

N. Patagon., at Carmen de Patagones, Golfo de San Jorge.

10. F. FUEGIANA Hook. f.

Erect, tall, 30–60 cm., glabrous. *Leaves* substrict, short, 7–10 cm.; broadly linear, acute, involute-margined. Ligules long. *Panicle* effuse or contracted, 10 cm. long with scabrous rays. *Spikelets* 8–10 mm. *Glumes* ovate-lanceolate, acuminate, subcarinate. Flowers short-pediceled, webby at base. *Flowering glume* acuminate, 5-nerved, the nerves silky on the back. (Fig. 42, on right.)

Patagon., Chubut; Fuegia, everywhere in rocky, maritime and mountainous parts.

F. FUEGIANA VIVIPARA Hook. f.

Viviparous form, with glabrous culms and effuse panicle, and spikelets 25 mm. long. (Fig. 42, on left side.) Patagonia.

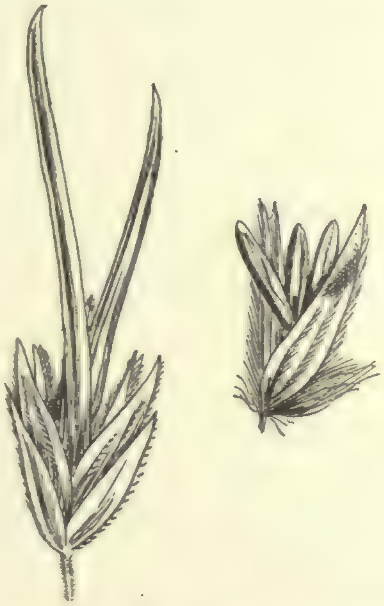

Fig. 42.
Festuca fuegiana. Spikelets, normal on right, viviparous on left. (From *Flora Antarct.*)

11. F. GLAUCOPHYLLA Phil.

Culm tall, sheathed almost to top, scabrous near top. Ligules short. *Panicle* 20 cm. long, lax, 2 rays in semiwhorls, these long, capillary, spiculiferous at top.

Spikelets 10 mm. long, 4–5-flowered. *Glumes* unequal; *floral glume* puberulous, 8 mm., shortly *awned.*

W. Patagon., by Rio Palena.

12. F. GRACILLIMA Hook. f.

Glabrous. Culms tall, nearly a meter, slender, exceeding the linear-filiform, involute *leaves. Panicle* simple, long, few-flowered, inclined. *Spikelets* rather large, 7–9-flowered, exceeding the flat pedicels. *Glumes* unequal, linear-oblong, scarious-bordered, the upper broader, 3-nerved; *floral glume* puberulous, shortly awned. Flowers remote at the base.

(Calif.) Magellan; Valley of Rio Gallegos; N. and E. Fuegia (Dusén); N. Patagon., by Lago Nahuel-huapi, W. Patagon., by R. Aysen, on the elevated steppes (Dusén).

F. GRACILLIMA BREVIFOLIA Speg.

Leaves more rigid than in the type, half as long as the culm. *Panicle* more lax and strict.

Magellan, by Gregory Bay and Possession Bay; Fuegia.

F. GRACILLIMA PATAGONICA Speg.

Leaves coarser, rigid, more trigonal. *Floral glumes* puberulous. S. Patagon., by Rio Gallegos.

13. F. LECHLERIANA Steud.

Somewhat creeping. *Culms* 30–60 cm. high, the floriferous and the sterile mixed. *Leaves* narrow, canaliculate or convolute, puberulous; ligules short, ciliolate above; lowest with short sheath and short blade. *Panicle* 7–10 cm. long, the rays solitary and paniculately divided, the raylets few-spiculate. *Spikelets* 5–7-flowered; flowers lax. *Glumes* lanceolate, exceeding the lowest flower; *floral glume* 7-nerved, mucronulate below the apex.

Magellan.

14. F. MURALIS Kth.

Culm and sheaths glabrous. *Leaves* narrow-linear, internally pubescent. *Panicle* simple, secund, its rays alternate. *Glumes* all glabrous; *spikelets* lanceolate, compressed, 5–9-flowered, with rough *awns* which exceed the non-ciliate floral glumes.

(Chili, etc.); Patagon., by Rio Chubut, on dry, elevated plains.

F. MURALIS PYGMÆA.

Patagon.; at Puerto Madryn.

15. F. MYURUS Linn.

Root fibrous. *Culm* basally geniculate, erect, 15–30 cm., covered by sheaths up to the panicle. *Leaves* convolute; ligules 2-auricled. *Panicle* long, racemose, subsecund, erect or nodding. The upper empty *glume* acute, the lower setaceous shorter. *Flowers* in fives, lanceolate-subulate, attenuate, *long-awned*, scabrid.

(S. Eur.; Argent.); Patagon.

16. F. OVINA Linn.

Slender-tufted or creeping, 15–50 cm. high; leaves one third the height of the culm; the sheaths with auricled throat and short ligules; culm 2–3-leaved; sterile shoots with numerous leaves, more or less conduplicate. *Panicle* compact, subsecund, 3–10 cm. long. *Spikelets* subelliptical, 3–8-flowered; *floral glume* narrow, scarious-margined, involute with age, shortly awned. *Grain* oblong, grooved, adhering to glume and *palea*.

(In N. Hemisphere, greatly varying; Brit. & Br. i, 217.)

16*b*. F. OVINA ANTARCTICA Hack.

As var. *magellanica*, but its *leaves* are (especially the sheaths), waxy-glaucous, the *culms* low, 4–5 cm., the *panicle* only 2–3 cm. long; floral glumes strigillose.

E. Fuegia. (Ansorge.)

16*c*. F. OVINA BREVIFOLIA S. Watson.

Leaves all setaceous, the uppermost very short, almost obsolete, sheaths loose, soon splitting.

(Subarctic in both hemispheres; and in Rocky Mts.)

At Coy Inlet. (J. B. Hatcher, Nov. 23, 1896.)

16*d*. F. OVINA DURIUSCULA (L.). *F. duriuscula* Linn. Hard Fescue.

Culms rather tall and stout, and *leaves* firm, usually smooth. *Panicle* mostly lax; floral glumes 6 mm. long.

(Eurasia; Algeria; nat. in N. Amer.; Austral.; N. Zeal.); Magellan, Fuegia.

16*e*. F. OVINA MAGELLANICA (Lam.) Hack. (*F. magellanica* Lam.)

Rhizome branching, its branches long-filiform, producing fertile and sterile *culms* to 20 cm. high. *Leaves* shorter than culm, convolute-filiform, pubescent inside, smooth outside; ligules short, ciliolate. *Panicle* simple, slightly unilateral, rigid, 5–7 cm. long; its *spikelets* 7–10 mm., oval, 4–5-flowered. *Glumes* unequal, acute, the lower 1-nerved, linear, the upper 3-nerved, lanceolate, half as long as the spikelet. *Flowers* spreading, not purplish but olive, *shortly awned*. *Ovary* glabrous. Varying much, foliage always rigid.

Magellan, Fuegia; Falklands.

17. F. PATAGONICA Phil.

Culm 28 cm. high, glabrous, purplish; *leaves* erect, narrow-linear, plane, rarely half as high as the culm; ligules long. *Panicle* contracted, linear; pedicels scabrid. *Spikelets* 7 mm. long, 4-flowered; *glumes* subequal, ovate-acuminate, toothed above in the keel; upper empty glume 3-nerved at base, 3 mm. long; *floral glume* ovate, obtuse, 1-nerved, keeled from the middle, 4 mm.

At Lago Pinto, S. Patagon.

18. F. PLATYPHYLLA Steud.

Culm stout, erect, 45–60 cm., glabrous. *Leaves* thickish, lanceolate, rigid-acuminate, 7–17 cm. by 8 mm. at base; ligules short, laciniate; the lowest sheaths often ending in short lanceolate appendages. *Panicle* strict, its rays paired or solitary, angular; raylets few-spicular. *Spikelets* lax, 7-flowered; *glumes* unequal, shorter than the lowest flower, green-purplish; *floral glume* with minute setulæ.

Magellan.

19. F. POGONANTHA Franchet.

Cespitose, glaucous; *culms* tall, to 60 cm., slender, smooth. *Leaves* much shorter, smooth, convolute. *Panicle* lax, cernuous, its rays rather short, suberect. *Glumes* lanceolate, mucronate, purplish, the lower scarcely more 3-nerved than the upper. *Flowers* 2–3, scarcely exsert, enclosed by hairs; *floral glume* like the empty glumes, acute; *palea* bicuspidate, marginally long-ciliate. Occasionally viviparous. (Fig. 41.)

Patagon. (Port Eden); Fuegia.

20. F. PURPURASCENS Banks & Sol.

Stoloniferous. *Culms* tall, to one meter, slender, glabrous, remotely nodose. *Leaves* plane in part, acuminate, shorter than the culm. *Panicle* lax, inclined, its rays elongate, few-flowered at the apex. *Spikelets* oblong, 12 mm. long, about 8-flowered; *glumes* 3-nerved, lanceolate, the upper thrice larger; flowers glabrous; *floral glume* 5-nerved, 3-toothed, the midtooth *awned.* (Fig. 43.)

Magell.; Sta. Cruz Valley (Hatcher); Fuegia (Hatcher).

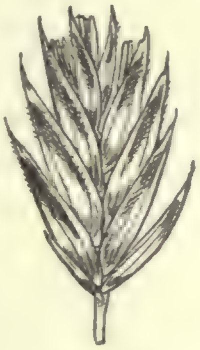

FIG. 43. *Festuca purpurascens.* Spikelet.

21. F. PYROGEA Speg.

Perennial, cespitose, small, 20–30 cm. tall, the *leaves* shorter than the pubescent *culm;* ligules none, but sheaths auricled above; the leaf-blades subulate, glabrous, slender, rigid, obtusely pointed. *Panicle* as a lax spike, the rays paired. *Spikelets* lanceolate, compressed, 3-flowered. *Glumes* unequal, subcarinate. *Floral glume* 3-nerved, scabrid, long *awned.* Palea hyaline-bifid.

S. Fuegia, at Ushuaia, found once only, but abundant. (Speg.) "Marked by the *leaves* being without ligules, the *sheaths* having bilaterally unequal *auricles*, subulate *laminæ*, and pubescent *culms.*"

22. F. SERRANOI Phil.

Culm tall, naked a great way at the top, smooth; ligules short. *Panicle* 22 cm. long, few-flowered; the semi-whorls far distant, each ray 2-branched, and each branch 5-spiculate at the top. *Spikelets* 8–10-flowered, 18 mm. long; *floral glume* 8 mm., cuspidate.

W. Patagon., by Rio Palena.

23. F. SHUKA Speg.

Perennial, cespitose, small, 12–30 cm. tall, the *leaves* involute, glabrous, scarcely shorter than the culms; ligules long, acute, exsert. *Panicles* spike-like; the rays in 2's or 3's. *Spikelets* lanceolate, compressed, 4-flowered. *Glumes* equal, long, navicular-carinate. *Floral glume* relatively broad, 7–8 mm. by 2 mm., rough, apically mucronate, *not awned.*

Beautiful with its long ligules; habit of *F. antarctica* Kth.
Staaten I., Fuegia; rare in maritime, rocky places.

54. BROMUS Linn. Bromegrass.

Leaves flat, the sheaths often closed. *Panicles* exserted, the pedicels thickened above; the *rachilla* articulated between the floral glumes. *Spikelets* large, several-flowered. *Glumes* unequal, the empty glumes not awned, or the second sometimes with a short awn; *floral glume* longer, 5–9-nerved, the apex hyaline, bifid, the midnerve produced as an *awn; palea* as long, its two keels ciliate. *Stamens* 3 or fewer. *Styles* short, lateral. *Grain* adhering to the palea.

Species 40, in temperate regions. Brit. & Br. i, 219.

KEY TO THE SPECIES.

A. Spikelets 1–4-flowered, plant robust, with rather broad, long leaves. Rays in 5's, each 1–3-spiculate. Spikelets 13 mm. long. *patagonicus.*

*A*2. Spikelets 2–6-flowered, 12–25 mm. long, the flowers not imbricate. Awn jointed and twisted. Cespitose, 60 cm. tall. *trinii.*

*A*3. Spikelets 4–7(12)-flowered.

- *b*. Spikelets 5-flowered, with short awns. Culms about 25 cm.
  - *c*. Panicle simple, its rays 1-spiculate; spikelets to 15 mm. Leaves linear, velvety. Floriglumes 5-nerved. *pellitus.*
  - *c*2. Panicle 4-spiculate; spikelets longer than their pedicels, purplish. Leaves puberulous; floriglume silky. *pictus.*
- *b*2. Leaves hairy or rough.
  - *c*. Culm 10 cm.; leaves narrow, convolute-setaceous. Spikelets 1–3, each 6–12-flowered. Floriglume 9-nerved, awn rather long. *macranthus.*
  - *c*2. Culm 50 cm.; leaves linear. Panicle nutant, rays mostly in twos. Spikelet 5–6-flowered. Floriglume 9-nerved, with short straight awn. *hænkeanus.*
  - *c*3. As *hænkeanus*, but spikelets 4–5-flowered, and floriglumes 7-nerved. *andinus.*
  - *c*4. Culm 75 cm.; leaves flat. Panicle rays 2–3-spiculate. Floriglume 14 mm., very acute, short-awned or awnless. *unioloides.*
- *b*3. Leaves glabrous, flat. Culms 1 meter tall. Awns short.
  - *c*. Stout, nodes all subbasal. Leaves linear. Panicle 18 cm. long, rays 2-spiculate. Spikelets 2 cm., green and violet, 4–6-flowered. Floriglume 16 mm. long, 7-nerved. *hackeli.*
  - *c*2. With woody rhizome. Leaves lanceolate, rough-edged. Panicle 30 cm. long; rays 1–3-spiculate. Spikelets violet to white, variegated. Empty glumes short. *coloratus.*

1. B. ANDINUS Phil.

Culms 1 meter high, smooth; leaves and sheaths except the lowest glabrous; *leaves* plane, with a long ligule. *Panicle* 25 cm. long, few-flowered, lax; the paired rays of each semiverticil bearing on their upper half few acute spikelets; pedicels nearly equalling the spikelets, rough, gradually thicker. *Spikelets* to 27 mm. long, 4–5-flowered; *glumes* 3-nerved, 11 mm. long, the upper a third larger; *floriglume* 13 mm. long, 7-nerved, margin broad, scabrous, hyaline, *awn* 5 mm.

In Andes of Chillan (Spegazzini); its lower leaves 5 mm. broad; ligules 5 mm. long. Differs from *B. hænkeanus* by its acute, 4–5-flowered spikelets.

B. ANDINUS SCABRIVALVUS Speg.

Glumes minutely appressed-pubescent.

Chubut, by Lago Fontana.

2. B. COLORATUS Steud.

Rhizome woody. *Culm* jointed at the base, stout, 1 meter high, striate, glabrous. *Leaves* lanceolate, 15–30 cm. by 1–4 mm., rough-edged; the ligules ovate, toothed. *Panicle* 30 cm. long, its rays semi-verticillate, rough, naked at base, 1–3-spiculate. *Spikelets* compressed, 5–7-lax-flowered, violet to whitish, variegated. *Glumes* shorter than the lowest flower; *floral glume* glabrous, shortly *awned* below its apex.

Magellan, Punta Arenas; Fuegia, south of Navarino I.

B. COLORATUS VIVIPARUS Steud.

Differs from the species by having *spikelets* green, few-flowered, very large (40–50 mm. by 10 mm.); *flowers* awnless, the lower sterile, the upper viviparous.

Fuegia, by borders of woods.

3. B. HACKELI (Hack.) Macl. (*B. patagonicus* Hack. *nec* Phil.)

Culm erect, 1 meter high, stout, glabrous, its few nodes crowded below. Sheaths close, the lower pubescent; ligules ovate, 3–4 mm., erose; *leaf-blades* linear to 12 cm. by 4 mm., glabrous. *Panicle* oblong, rather simple, to 18 cm. long; its rays paired, rough, 2-spiculate. *Spikelets* oblong, 2 cm. long, compressed, mixed green and violet, 4–6-flowered. *Empty glumes* slightly unequal (10–12 mm.), lanceolate, 3- and 7-nerved, keels rough; *floral glume* lanceolate, acute, 16 mm., 7-nerved, shortly awned; *palea* as long, its keels spinulose-ciliate. *Ovary* 3-horned.

So. Patagon. (O. Nordenskjöld.)

4. B. HÆNKEANUS Knth.

Root fibrous. *Culm* erect, terete, glabrous, to 60 cm. tall. *Sheaths* rough-hairy; ligules ovate, exsert, denticulate. *Leaves* linear, plane, both sides rough. *Panicle* simple, contracted, nodding; rays in 2's below, single above, about 1-spiculate, and the *spikelet* 5–6-flowered. *Lower glumes* ovate, 3 and 9-nerved; *floral glume* 9-nerved, rough, 2-toothed, with a short straight *awn* between its teeth.

Patagon., Chubut, in upland meadows.

5. B. MACRANTHUS Meyen. (*B. setifolius* Presl.)

Cespitiferous annual with fibrous roots. *Culms* decumbent at base, terete, striate (10–12 cm.), rough at the panicle and sheaths. Ligule short, ovate, fimbriate. *Leaves* narrow-linear, convolute-setaceous, rigid, hairy. *Panicle* depauperate, of 1–3 spikelets, each 6–12-flowered. *Glumes* roughish, slightly unequal, 3–5-nerved; *floral glume* oval, 9-nerved, rough, obtuse; subapical *awn* two thirds as long as the spikelet.

(Mex.; Chili); Patagon., Chubut.

(*B. mango* Desv. formed the chief bread-stuff in Chili before the advent of Old World cereals. Its grain has a linear hilum.)

6. B. PATAGONICUS Phil.

Culm robust, smooth, sheaths glabrous, ciliate below the mouth; ligule truncate, denticulate; *lamina* of upper leaves broad, very long. *Panicle* erect, its rays in 5's, each bearing 1–3 *spikelets;* these 13 mm. long, 4-flowered. *Glumes* ovate-lanceolate, acute, unequal, the lower 1-nerved, the upper 3-nerved. *Floral glume* with appressed hairs; subapical awn more than one third its length.

Chili; Patagonia.[1]

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[1] By the courtesy of Miss Day of the Gray Herbarium I give Philippi's description of this little-known species:

BROMUS PATAGONICUS Ph. Br. robustus, glabriusculus; vaginis lævibus, glabris, infra os ciliatis; ligula truncata, denticulata; lamina foliorum superiorum longissima, lata; panicula erecta ramis quinis in quovis semiverticillo, erectis, apice spiculas 1 ad 3 gerentibus; spiculis pedicello longioribus, 6 lin. (13 mil.) longis, quadrifloris; glumis ovato lanceolatis, acutis inæqualibus, inferiore uninervia, superiore trinervia, dimidiam spiculam æquante; palea inferiore (sublente fortiori pilis appressis vestita) uninervia, apice biloba; arista sub apice orta tertiam paleæ partem superante.

Philippi, Anal. Univ. Chile, XLIII, 1873, p. 577.

7. B. PELLITUS Hack.

Culm low, 20 cm., erect, rather robust, pubescent. *Leaves* velvety, linear-obtuse, 4 cm. by 2–3 mm., the ligules truncate. *Panicle* 4 cm., oblong, crowded, simple, its rays 1-spiculate. *Spikelets* oval, to 15 mm. long, 5-flowered, with dense hairs; glumes 3-nerved, 6 and 8 mm. long; *floral glume* dorsally velvety, 5-nerved, shortly awned; palea as long, truncate, its keels ciliolate.

Has the habit of *B. mollis* L.

S. Fuegia. (Dusén.)

8. B. PICTUS Hook. f.

Culm simple, 30 cm. tall, strict, puberulous. *Panicle* simple, 4-spiculate, the spikelets exceeding the pedicels. *Glumes* linear-oblong, subacute, 5-flowered, purple; *floral glume* linear-ovate, obtuse, with a short infra-apical *awn*, 7-nerved, silky towards the base.

Magellan, Punta Arenas; E. Patagon. Characteristic of the grassy plains. Fuegia.

9. B. TRINII Desv.

Cespitose annual, 15–90 cm. high. *Leaves* glabrous or hairy. Ligules ovate, toothed. *Spikelets* 2–6-flowered, 12–25 mm. long, subcompressed, ovate or lanceolate. *Glumes* linear, acuminate, 1–3-nerved; flowers not imbricate. *Floral glume* linear-oblong, attenuate both ways, 5-nerved, hirtellate, 2-lobed, awned between the lobes, the *awn* twisted, geniculate, divaricate.

Patagon., at Puerto Madryn; in woods on Cordilleras.

10. B. UNIOLOIDES Kth. Southern Chess.

Culm erect, to 90 cm. tall, 4–5-leaved, mostly glabrous. Lower sheaths often overlapping and often rough; leaf-blades flat, scabrous on upper surface. *Panicle* rays erect or spreading, in 2's or 3's, few-spiculate upwards. *Spikelets* compressed, 6–10-flowered. *Empty glumes* unequal, acute, firm, 3–5- and 5–9-nerved; *floral glumes* very acute, 12–16 mm. long, awn short or wanting. *Palea* 10 mm., pectinate-ciliate, incurved.

(In southern U. S. and through S. Amer. Brit. & Br. i, 224.) N. Patagon.; S. Patagon. (Dusén); Magellan; Fuegia.

B. UNIOLOIDES HIRSUTUS Speg.

Dwarf, 20–40 cm. high. *Leaves* laxly pilose, their sheaths retrorsely hirsute.

S. Patagon., by R. Sta. Cruz.

B. UNIOLOIDES HUMILIS Speg.

Dwarf, 10–15 cm. high, glabrous. *Leaves* narrow, short, subrigid. *Culm* erect, few-flowered. *Spikelets* 4–5-flowered, shining.

S. Patagon., by RR. Gallegos and Sta. Cruz.

B. UNIOLOIDES MICRANTHUS Speg.

Variety slender, tall and glabrous; *panicles* narrow, erect; *spikelets* not nutant, small, 3–4-flowered (8–10 mm. by 3 mm.), compressed and pale green. *Glumes* and *paleæ* acute, *not awned.*

Patagon., Chubut, in marshy woods.

55. LOLIUM Linn. Darnel.

Flat *leaves*, and terminal, often long, *spikes; spikelets* solitary, sessile and alternate in the notches of the rachis; compressed with their edge towards the rachis; having each only 1 *empty glume*, except the terminal spikelet which has 2.

Species 6, of the Old World; introduced to Amer.

1. L. BRASILIANUM Nees.

Root repent, with leafy fascicles. *Culms* ascending, 15–45 cm. high, simple, compressed, above retrorsely scabrous. *Leaves* linear, plane, acuminate. *Spike* nearly muticous (5–15 cm.); *spikelets* 5–10-flowered. *Floriglumes* acute, the upper short-setulose below their apex. Perennial.

(Brazil); N. Patagon., in elevated places near Rio Negro.

2. L. PERENNE Linn. Ryegrass.

Root perennial. *Empty glume* shorter than the 8–15-flowered *spikelet; floral glume* awnless or shortly awned.

(Eur., nat. in N. Amer., Brit. & Br. i, 225.)

Magellan (Dusén); Falklands, on sandy shores.

3. L. TEMULENTUM (Desv.) Hack. Bearded Darnel.

Root annual. *Empty glume* as long as the 5–7-flowered *spikelet; awn* 12 mm. long, exceeding the flower. The seeds have a narcotic poison.

(Eurasia; N. Amer.) Magellan. (Dusén.)

56. LEPTURUS R. Br. Hard-grass.

Low, branching annuals, or taller perennials, with narrow *leaves*. *Spike* simple, terminal, slender, having 1–2-flowered spikelets, distichous in the excavations of a jointed rachis. Rachilla short, articulated above the lower glumes; produced like a short awn. *Empty glumes* 1–2, rigid, much longer than the hyaline *floriglume*. *Palea* hyaline, 2-nerved.

Species 6; Old World, some in Austral., N. Zeal. and Pacific Is., and 1 introduced to U. S. (Eng. & Pr. ii. 2, 25, fig. 15.)

L. CYLINDRICUS Trin. Arech. Las Gram Urug., p. 4,689, n. 69.

N. Patagon. in dry places near Carmen.

57. AGROPYRON J. Gaertn. Wheat-grass.

Spikes simple, terminal, with large, many-flowered, sessile spikelets, single and alternate in the notches of the rachis; the *spikelets* compressed, with their sides towards the rachis. The 2 *lower glumes* empty; the *floral glume* rigid, rounded, its 5–7 nerves partly connivent above, having a callus which falls off with the ripe grain; palea often ciliate on its keels. *Styles* short; *grain* pubescent at apex. *Upper flowers* of the spikelets often more or less imperfect. (Distinguished from *Triticum* by its floral glumes having connivent nerves, and the deciduous callus.)

Species 30; of temperate regions.

1. A. ELYMOIDES Hack.

Cespitose; *culm* stout, 20–30 cm. tall, glabrous, 2-nodal, naked upwards; the sheaths resolved into fibers, the *leaf-blades* linear-acute, 8–10 cm. by 2–3 mm. *Spike* linear, dense, 6–8 cm. long. *Spikelets* imbricate, ovate-oblong, 3-flowered and a rudiment, 12 mm. long. *Empty glumes* subequal, very narrow linear-lanceolate; *floral glume* much broader, 8–10 mm., ending in an awn of 3 mm. *Palea* as long, its keels ciliolate.

E. Fuegia. (Dusén.)

2. A. FUEGIANUM (Speg. sub *Triticum*).

Perennial. Base cespitose or creeping. *Leaves* fasciculate, erect, hispid, much shorter than the fertile culms; their laminæ plane, narrow, apically involute-subulate; ligules very short, truncate. *Culms* erect, sheathed half-way, shining. *Spike* short, lax, few-flowered. *Spikelets* sessile. *Empty glumes* obovate, glabrous, awnless. Floral glume 5–7-nerved, coriaceous, scabrid upwards, *awned; palea* hyaline, subretuse, its margin pectinate-ciliolate.

W. Fuegia, by margin of salt lakes.

A. FUEGIANUM PATAGONICUM Speg.

Leaves and sheaths glabrous. *Ligules* more developed than in the type. *Spike* more depauperate; spikelets more remote. *Glumes* longer, awned. *Floral glume* more glabrous.

S. Patagon., by Gregory Bay, and Rio Sta. Cruz.

3. A. MAGELLANICUM Hack. (*Triticum repens magellanicum* Desv. *T. magellanicum* var. *glabrivalva* Speg.)

Rhizome creeping. Culm 45–90 cm. high. *Leaves* internally punctate-scabrid, plane or convolute; ligules very short, toothed. *Spike* 8–15 cm. long, green. *Spikelets* erect, rather lax, oblong-elliptical, compressed, 12–16 mm. long, 3–4-flowered. *Glumes* subequal, half as long as the spikelets, convex, 4–6-nerved, inequilateral, muticous or mucronate, apically erose. *Floral glume* 5-nerved, oblanceolate-elliptical, muticous or short-awned, often emarginate, outside densely hairy-scabrid.

S. Patagon. on eastern and western coasts; Magellan; Fuegia; Staaten; Falklands.

A. MAGELLANICUM CONDENSATUM (Presl.) Speg. (sub *Triticum*).

Leaves involute, rather scabrous; sheaths glabrous; ligules short (1 mm.), truncate, entire. *Spike* distichously branching, dense, erect, strict (7 cm.). *Rachis* triquetrous. *Spikelets* 6-flowered. *Glumes* oblong-lanceolate, acute, 7-nerved, half as long as the lanceolate flowers; *floral glume* 5-nerved, scabrous, mucronate; *palea* emarginate, bidentate.

Perennial (Chili?); Fuegia; S. Patagon. by Rio Sta. Cruz.

A. MAGELLANICUM FESTUCOIDES Speg.

Pedicels long. *Flowers* at length lax. Empty and floral *glumes* more narrow and acute than in the type. (Perhaps a distinct species.)

S. Patagon., by Rio Sta. Cruz.

A. MAGELLANICUM LASIOPODUM Speg.

Green, not rigid. *Spikelets* slender; pedicels very short, densely silky-bearded. *Glumes* hirsute, acute, awned, as long as the rough flowers. Lowest *leaves* pubescent. (Perhaps a distinct species.)

S. Patagon., by Rio Sta. Cruz.

A. MAGELLANICUM SECUNDUM (Presl). (*Triticum secundum* Presl.)

Root creeping. *Culm* basally ascending, then erect, covered by sheaths and with glabrous nodes. Margin of ligule narrow; *leaves* involute, scabrid. *Spike* secund, erect, dense, 10 cm. long; rachis semiterete; *spikelets* 3-flowered. *Glumes* lanceolate, rather shorter than the spikelets, 7-nerved, mucronate, scabrid, as is the 5-nerved *floral glume*. *Awn* not as long as the floral glume. Perennial.

(Chili); S. Patagon., by Rio Chico de Sta. Cruz; Magellan; Fuegia.

4. A. PUBIFLORUM Steud.

Root long-fibrous (scarcely creeping); *culm* jointed at the base, thence or entirely erect, 60–90 cm. tall, terete, glabrous. *Sheaths* striate, glabrous (the lowest slightly violet); ligules short, hyaline, obtuse, denticulate. *Leaves* narrow-linear, subsetaceously-attenuate, smooth, glabrous, 10–25 cm. long. *Spike* long, erect, to 15 cm., rather distichous. *Spikelets* 5–7-flowered. *Glumes* lance-ovate with hyaline-membranaceous margin, acute, 3–5-nerved, rough on the nerves. Rachis angular-setulose. Flowers distinct; *floriglume* puberulous all round, ciliolate, 5-nerved, long-acuminate (not awned). *Palea* as long, narrower, its keel ciliolate.

Magellan; Cabo Negro; Rio Gallegos; common through Fuegia.

5. A. REPENS (Linn. sub *Triticum*) Beauv. Couch-grass.

Rootstock long, jointed. *Culm* 30–120 cm. tall; sheaths glabrous; *leaves* 20 cm. by 5–10 mm., rough on upper surface, their ligules short. *Spike* strict, 6–20 cm. long; *spikelets* 10–20 mm., 2–5-flowered, the mid-flowers overlapping. *Empty glumes* unsymmetrical; *floral glume* 10 mm. long, cuspidate or shortly awned.

Many varieties, from differences in size of spikelets, in forms of glumes, etc. (Brit. & Br. i, 226.)

(Eurasia, N. Afr.; nat. in N. Am. A mischievous weed in cultivated lands.) Patagon.; Magell.; Fuegia to Cape Horn; Falklands.

A. REPENS PUNGENS Brongn.

Glumes and *paleæ* pubescent; *spikelets* with up to 6 flowers. Plant more stout than the northern form.

Patagonia.

58. HORDEUM Linn. Barley.

Erect annuals, rarely perennials, with flat *leaves*, and terminal *spikes* having 1-flowered *spikelets* inserted in triplets, or 2, or 6, at each joint of the rachis; the mid-one of each triplet being sessile, and the lateral pair with short pedicels and imperfect flowers. *Rachilla* articulated below the flowers, and produced above them as long awns or as glumes. *Empty glumes* rigid, often awn-like, and the six belonging to each triplet forming an involucre. *Floral glume* strong-awned; palea nearly as long. *Styles* short; *grain* adherent to the palea.

Species 16, in Eurasia, N. Afr. and Amer.

KEY TO THE SPECIES.

- *A.* Spikelets distichous, 2-ranked in the compressed, subcurved spike. Of the paired spikelets one is perfect and one neutral. Floriglumes awnless. *andicolum.*
- *A2.* Tristichous, spikelets in triplets.
  - *b.* Culm creeping. Leaves hairy. Glumes all setaceous and scabrid. Mid-floriglume long-awned. Lateral spikelets male. *comosum.*
  - *b2.* Spike cylindrical, slender. Leaves short, convolute. Glumes scabrid; mid-floriglume long-awned; lateral spikelets neuter. *chilense.*
  - *b3.* Spikes breaking into segments when ripe.
    - *c.* Hairy. Coarse annual. Leaf-blades 5 cm. long. Joints of rachis 3 mm. Spike partly sheathed. Mid and lateral floriglumes dorsally flat, scabrous above. *murinum.*
    - *c2.* Glabrous. Joints of rachis less than 2 mm.
      - *d.* Culm basally geniculate.
        - *e.* Culm 20 cm. Leaves narrow. Spike rigid, scarcely protruding. Empty glumes smooth. Lateral spikelets short-awned. *maritimum.*
        - *e2.* Culm 50 cm. Leaf-blades 11 cm. long. Empty glumes rough. Central floriglume short-awned. *pratense.*
      - *d2.* Culm 40 cm. Spike 6 cm., with a slender rachis, easily breaking. Central floriglume and lateral empty glumes long-capillary. *jubatum.*
- *A3.* Spikelets hexastichous, in six ranks, and all perfect. Erect annual, 70 cm. tall. Spikes 10 cm., compressed. Awns often 15 cm. Floriglume adhering to the grain. *hexastichon.*

1. H. ANDICOLUM Gris.

Cespitose perennial, with fibrous rhizome. *Culms* 20–30 cm. high; leaves plane, acuminate, glabrous. *Spike* linear, compressed, slightly curved. *Spikelets* distichous, spreading; the sterile spikelets neutral, little shorter than the perfect. *Empty glumes* setaceous; *floral glume* oblong-lanceolate, acuminate, awnless; the *palea* linear, shortly 2-toothed.

S. Patagon and E. Fuegia (Dusén); high up in the mountains of Argentina.

H. ANDICOLA PUSILLUM.

At Puerto Madryn. (Dusén.)

2. H. CHILENSE Brongn.

Leaves short, subulate-lanceolate, erect, convolute, glabrous. *Spike* cylindrical, slender. *Glumes* subulate, subequal, scabrid. *Mid-flower* fertile, its *floral glume* lanceolate, awned, *awn* as long as the glumes. The *lateral flowers* neutral, with 1 glumelle; the inner empty glume basilanceolate.

(Chili); Patagon., Chubut, on dry hills; Fuegia. (Speg.)

3. H. COMOSUM Presl.

Creeping. *Leaves* plane; sheaths and blades pubescent. *Glumes* all setaceous, scabrid. Lateral flowers male, short-awned; mid-flower perfect, its *floral glume* 3-nerved, with rough apex and long awn.

(Chili.)

H. COMOSUM FLAVESCENS Desv.

E. Fuegia. (Dusén.)

4. H. COMPRESSUM Griseb.

Annual, ascending to 30 cm. *Leaves* plane, linear-acuminate, scabrous. *Spike* linear-compressed. *Spikelets* awnless, scabrous. Empty glumes linear-acuminate, as long as the flower in the neuter spikelets, half as long as the fertile spikelets, in these lance-linear, subpungent, exceeding the palea. *Flowers* of lateral spikelets neuter. *Ovary* apically pilose.

(Argentina); S. Patagon. in salinas by R. Sta. Cruz.

5. H. JUBATUM Linn. Squirrel-tail.

Culm to 50 cm. tall, simple, slender, glabrous. *Sheaths* lax, usually shorter than the internodes. *Spike* 8 cm. long, when ripe breaking into segments. Awns of the empty and floral *glumes* long, smooth below.

(Arctic and temperate parts of N. Amer., Brit. and Br. i, 229.)

H. JUBATUM PILOSUM Franchet.

Leaves shortly hirtellate. Empty and floral *glumes* scabrid.
Magellan, Punta Arenas; Fuegia.

H. J. COMOSUM O. Ktze.

Yellowish.
Patagon.

H. J. MEDIUM O. Ktze.

Versicolored. Awns 3–4 cm. long.
Patagon.

H. J. NORMALE.

Violaceous.
Patagon.

6. H. MARITIMUM With. (*H. chilense* R. & S. nec Brongn.)

Root fibrous, cespitiferous. *Culms* erect, 10–22 cm. high, basally geniculate, glabrous. *Leaves* narrow, glaucescent, smooth. *Spike* erect, rigid, 25 mm. long. *Lateral flowers* male, short-awned, their inner *glumes* lance-oblong at base, the other setaceous.
(Eurasia and Amer.); Argent.; Patagon.

7. H. MURINUM Linn. Wall-barley.

Cespitiferous annual with fibrous roots. *Culms* basally decumbent, becoming erect, 30 cm. high, smooth. *Spike* erect, dense, 5–7 cm. long, many-flowered; its rachis articulate, frail with rough angles. *Flowers* all awned. *Glumes* of the mid-spikelet linear-lanceolate, ciliate, of the laterals setaceous-scabrid.
(Eurasia and Amer.); Patagon.

H. M. VELUTINUM Speg.

Leaves densely velvety on both surfaces.
S. Patagon., in old cultivated lands by R. Sta. Cruz.

8. H. PRATENSE Huds. (1762). Meadow-barley. (*H. secalinum* L. 1771; *H. nodosum* L. 1762.)

Cespitose perennial with hard roots. *Culms* sterile and fertile, geniculate at base, 50 cm. high. *Leaves* usually smooth, linear, the ligules short and rounded. *Spike* exserted, 3–7 cm. long, readily separating when ripe. *Empty glumes* all subulate, scabrous; *mid-flower* cylindrical, shortly awned.

(Eurasia; W. United States; Chili); N. Patagon.

H. PRATENSE BRONGNIARTI. (*H. secalinum chilense* Brongn. nec Desv.)

Perennial, cespitose, with hard roots, and *culms* with reticulately tunicate base; 30–45 cm. tall. Leaf-sheaths subglabrous; ligules short, rounded; *blades* smooth or with rough margin. *Spike* cylindrical, narrow, 3–7 cm. long. *Joints* of rachis equal above and below. *Spikelets* in 3's; *glumes* of lateral spikelets subulate-awned, as long as the awn of the hermaphrodite flower; the interior dilated at base, coriaceous. *Palea* 1, lanceolate, muticous; *glumes* of hermaphrodite flowers setaceous, nonciliate, often shorter than the awn. *Lower palea* lanceolate, attenuate-awned; *upper palea* lanceolate, attenuate.

(Chili); Valdivia; Chubut, on dry hills.

H. PRATENSE CHILENSE Desv.

Cespitose perennial with hard roots and basitruncate *culms*, some sterile, 30–45 cm. tall. *Leaf-sheaths* subglabrous; ligules short, rounded; *lamina* smooth or rough-edged. *Spike* cylindric-narrow, 25–75 mm. long. *Rachis-joints* equal throughout. *Spikelets* in 3's; *glumes* of lateral flowers awn-like, as long as the *awns* of the perfect flowers, the *palea* solitary, muticous.

E. Fuegia. (Dusén.)

9. H. PUBIFLORUM Hook. f. Wild-barley.

Culm to 25 cm., inclined at base, glabrous. Radical *leaves* 5 cm. long. involute; cauline leaves with long tumid striate sheaths, blades very short and subulate. *Spikes* 3–4 cm. long, tawny-purplish. Glumes all setaceous, hairy, scabrid above, 15 mm. long.

Its smaller size and purplish spikes with hairy glumes, distinguish it from *H. jubatum*. Growing wild in the hollows, it makes them purplish.

Magellan, S. Patagon., Sta. Cruz Valley (Hatcher); Fuegia.

(H. SECALINUM Schreb. = *H. pratense* Huds.)

H. secalinum Sav. = *H. maritimum*.)

10. H. VULGARE HEXASTICHON Linn.

Flowers all hermaphrodite, 6-seriate. *Spike* erect, terete, awned; the *awns* rather broad, more or less divergent, twice as long as the spike, which is 3–7 cm. long. Annual.

(Cult. in N. Hemisphere); N. Patagon. (cult.).

59. ELYMUS Linn. Wild-rye.

Culms tall; leaves flat; *spikes* dense having (1–)2–several-flowered *spikelets*, mostly in pairs, sessile in alternate notches of the rachis, with the *awned glumes* as an involucre. *Grain* adhering to the palea. (Fig. in Brit. & Br. i, 230.)

Species 30 in temperate regions. Distinguished from *Hordeum* by having 2 or more flowers in each spikelet (except *E. uniflorus*).

KEY TO THE SPECIES.

A. Culm thick, spikes green-violet.
  b. 75 cm. Leaves smooth, becoming convolute. Spike 8 cm. Spikelets in 2's and 3's; 3–4-flowered. Floriglume short-awned. *agropyroides.*
  b2. To 180 cm. Leaves 7 mm. broad. Spike 15 cm. Spikelets 1-flowered, 12 mm. long. Awn 17 mm. *uniflorus.*
A2. Culm leafy, sheathed to the top.
  b. Leaf-blades rough beneath, complicate. Spike 18 cm. Spikelets 18 mm., 5-flowered. Awn of floriglume 25 mm. *palenæ.*
  b2. Culms 60 cm. Leaves short, glabrous. Spike linear-oblong. Spikelets 2-flowered. Floriglumes awned, hairy above. *antarcticus.*
A3. Culms stout, 45 cm. Blades glabrous. Spike narrow, erect, long. Spikelets paired, 3-flowered. Awn short. *chubutensis.*
A4. Culms slender.
  b. Glabrous, nearly a meter tall, with innovations. Sheaths and blades long. Spike 7 cm. Spikelets 3-flowered. Empty glumes short. Floriglume awned. *albowianus.*
  b2. More or less puberulent.
    c. Culm 70 cm., sheathed half-way. Spike narrow; spikelets in 2's, 3-flowered, 2 of them fertile; leaves very narrow. Awn short. *leptostachys.*
    c2. Culm 30 cm. Spike 8 cm.; spikelets 2–3-flowered, 1–2 fertile. Awn long. *andinus.*
    c3. Culm 75 cm., naked. Leaves rigid, broad, pubescent on upper surface. Spikes 7 cm. Spikelets 3; 2-flowered. Awn short. *patagonicus.*

1. E. AGROPYROIDES Presl.

Culm erect, 60–90 cm., as thick as a goose-quill. *Leaves* ultimately convolute, smooth; ligules short, round. *Spike* 7–10 cm. long, rigid, dense, green-violet; *joints* of rachis biconvex, subcompressed, 4–6 mm. long at base of spike. *Spikelets* in 2's and 3's, 3–4-flowered, of these 2–3 fertile. *Glumes* alike, just shorter than the spikelet, lanceolate, acuminate. *Palea* of lower flower 8–9 mm. long, the *floral glume* 2-lobed, short-awned.

(Chili); Magellan; Fuegia.

Around Ushuaia is a form with pilose sheaths and leaves.

2. E. ALBOWIANUS F. Kurtz.

Culm nearly a meter high, slender, with innovations from the rhizome. *Culm-leaves* plane, glabrous with 17 cm. long sheaths and longer blades, acuminate. *Spike* 7 cm. long, rigid, green or green-violet. *Joints* of rachis biconvex, narrowly winged; *spikelets* (sometimes in triplets) 15–20 mm. long, including awns, 3-flowered. *Empty glumes* inequilateral, shorter than the spikelets, lanceolate, subulate or awned; *floral glume* 16–18 mm., ovate-lanceolate, 2-lobed, 3 of its 5 nerves continuing into an awn.

S. Fuegia; around Ushuaia; by Rio Gallegos (Dusén); W. Patagon.

3. E. ANDINUS Trin.

Culm slender, more than 30 cm. *Leaves* narrow, sparsely pilose; ligules short, truncate. *Spike* slender, linear, 5–12 cm.; joints of rachis plane inside, obtusely 4-angled; 6–10 mm. long at base of spike. *Spikelets* in pairs, 10 mm. long, 2–3-flowered, 1 of them sterile. *Glumes* linear, 3-nerved, acuminate, awned, shorter than the spikelet. *Paleæ* of lowest flower subequal, 8 mm. long, narrow, the lower (floral glume) with awn 12–22 mm. long.

(Chili); S. Patagon., on dunes by Lago Argentino.

4. E. ANTARCTICUS Hook. f.

Culms erect, 60 cm. tall, leafy, glabrous; sheaths 12 cm. *Leaf-blades* shorter, plane, not exceeding the culms. *Spike* linear-oblong; spikelets 2-flowered. *Glumes* free to the base, lanceolate, awned-acuminate, entire or bifid. Flowers shortly pediceled; *floral glume* awned, 5-nerved, hairy upwards; *palea* 2-toothed.

One glume out of the 4 at each articulation is often bifid, the outer one on one side.

Magellan; Fuegia.

E. ANTARCTICUS FULVESCENS Kurtz. (*E. valdiviæ* Steud.)

Spike beautifully fulvescent; *sheaths* of the lower leaves pilose.

Magellan; Fuegia; Navarino I.

5. E. CHUBUTENSIS Speg.

Cespitose. *Culms* stout, 30–60 cm. tall, sheathed to the top, flaccid; sheaths glabrous; ligules very short, denticulate; *limbs* membranaceous, mediocre, subglaucescent, glabrous, scarcely subscabrous. *Spike* narrow, erect, 5–10 cm. long; *spikelets* paired; *glumes* narrow-lanceolate, acute; *flowers* 4–5, the lowest sessile, the others pediceled, the three lower fertile and with an *awn* not their own length; the uppermost one awnless and abortive.

Patagon., Chubut, in upland meadows.

6. E. LEPTOSTACHYUS Speg.

Cespitose, slender, 60–80 cm. tall; lower *sheaths* pubescent, others glabrous, more or less elongate; ligule very short, denticulate; *limbs* membranaceous-rigid, linear, puberulous on both surfaces; *culms* long, leaf-sheathed half-way, mostly naked above. *Spike* very narrow, 4–8 cm. long, erect; *spikelets* paired; *glumes* shortly mucronate-awned; *flowers* in each spikelet three, the first sessile and fertile, the second pediceled and fertile, the uppermost pediceled and sterile; *floriglumes* of the fertile flowers with an awn not their own length.

Patagon., Chubut in meadows near woods, etc.

7. E. PALENÆ Phil.

Culm sheathed to the top; sheath smooth; *leaf-blades* scabrid below, over 4 mm. broad, complicate. *Spike* 18 cm. long, 9 mm. broad, green. *Spikelets* 18 mm. besides the awn, 5-flowered; *glumes* 10 mm., awn 5 mm.; *floral glume* with awn of 25 mm. length.

W. Patagon., by Rio Palena.

8. E. PATAGONICUS Speg.

Cespitose, slender; *sheaths* short, glabrous; ligules very short, denticulate; *leaf-limbs* rigid, rather broad; pubescent on upper surface, rigid on lower surface. *Culms* long, naked. *Spike* linear, erect, 5–8 cm. long, with *spikelets* in 3's, each 2-flowered; *glumes* scarcely mucronate; one flower sessile and fertile; *floral glume* 3-nerved, with very short *awn*, upper *palea* sterile, pediceled.

Patagon., Chubut, in upland meadows. Beautiful for its ternate spikelets.

9. E. UNIFLORUS Phil.

Culm 180 cm. tall, 4 mm. thick at its base. *Leaves* 7 mm. broad. *Spike* 15 cm. long, slender, green and violet. *Spikelets* 1-flowered, 12 mm. long; *glumes* 11 mm., nervose, short-awned. *Floral glume* ending in a 17 mm. *awn*.

W. Patagon., by Rio Palena.

60. CHUSQUEA Kunth. (of tribe *Bambuseæ*).

Woody, with leaves often small, articulating on the sheaths. Spikelets 1-flowered, variously panicled, the rachilla jointed above the lower glumes, not produced above the perfect, 3-androus flower. Empty glumes 4, the lower pair small or narrow, persisting, the upper pair like the floral glume, which is broad, 5–several-nerved, awnless. Palea as long as its glume, broad, 2-keeled upwards.

1. C. CULEOU Desv. "Culeou."

Erect, 3–4 mm. high, terminal culms robust; branches erect, 10–17 cm., fasciculate, many-leaved; leaves coriaceous, linear-elliptical, mucronate, with five primary nerves, the mid one prominent; ligule ovate-rounded. Panicle 1–2 cm. long, strict, spike-like, 1-sided. Spikelets 5–6 mm. long, obtuse; glumes slightly shorter; floral glume of the hermaphrodite flower, finely pubescent, 7-nerved, obtuse, mucronulate.

N. W. Patagon., by Valdivia, common in moist woods.

2. C. MACROSTACHYA Phil.

Leaves coriaceous, lance-linear, subulate, attenuate, the same color on both sides, mid-rib prominent. Floral glume setaceous.

W. Patagon., by Rio Palena.

3. C. PALENÆ Phil.

Branching, 14 cm. high. Leaves herbaceous, glaucous and glabrous underneath, cuneate at base, gradually ending in a long point, with no cross-veins. Floral glume very short, ovate.

W. Patagon., by Rio Palena.

4. C. QUILA Kunth. (*C. valdiviensis* Desv.) Quila.

Culm much branching. Internodes crowded, smooth. Branches fasciculately arising from the nodes, spreading, 4–5-leaved, smooth. Leaves lanceolate, 6–12 cm. by 4–6 mm., subattenuate at base and with a short petiole, glaucous-pilose underneath. Panicle 3–10 cm. long, becoming rigidly divaricate. Rachis angled, sulcate; pedicels puberulous. Spikelets ovate, shining, nervose. Empty glumes lanceolate-cuspidate, exceeding the neuter subequal flowers. Floral glume of second flower shorter than the terminal flower.

(Chili); W. Patagon. (Supra, p. 5.)

Family 11. CYPERACEÆ. The Sedges.

Grass-like or rush-like plants, usually with solid trigonous *stems* and narrow, mostly 3-ranked, *leaves* from closed *sheaths*. *Spikelets* glumiferous, each with one glume subtending 1 or rarely 2 flowers; the spikelets solitary or clustered. *Flowers* mostly diclinous with hypogynous perianth, consisting of bristles or scales, or without perianth. *Stamens* 1–3, rarely more, filaments slender. *Ovary* 1-locular, 1-ovuled; *style* 2–3-cleft or subsimple. *Achene* lens-shaped or trigonous. *Endosperm* mealy, enclosing in the center a minute embryo. The leaves are usually hard and sharp-edged and consequently unfit for fodder.

Species about 3,000, cosmopolitan, chiefly growing in damp places.

KEY TO THE GENERA.

A. Hermaphrodite; though some of the flowers may be imperfect.
Bristles or scales mostly representing a perianth.
b. Spikelets numerous.
Perianth-bristles 6, feathery, persisting. Spikelets 1–2-flowered. 1. *Carpha.*
Perianth none. Glumes 2-ranked. 2. *Cyperus.*
Perianth-bristles 6, or 1, or 0. Glumes spirally arranged. 3. *Scirpus.*
bb. Spikelet 1, terminal.
Several-flowered. Styles thickened, forming a rostrum on the achene.
Perianth-bristles 3–8, mostly 6. 4. *Heleocharis.*
Perianth none. Stamens 1–3. (*Fimbristylis* p. p.) 5. *Stenophyllus.*
1-, rarely 2-flowered. No rostrum. Leaves 2-ranked. 6 perianth-scales. 6. *Oreobolus.*
bbb. Spikelets panicled, few-flowered, with two-ranked glumes.
Perianth of 6 setæ or none. Achene obtuse, drupe-like. 7. *Elynanthus.*

AA. Diclinous. Perianth none; but achene enclosed in a utricle.
  b. Spikelets monœcious, the male spikelets above, many-flowered; the females below in the same spike, 1-flowered. Floral axis prolonged, often hooked. 8. *Uncinia.*
  bb. Spikelets monœcious or diœcious, all 1-flowered, each in the axil of a glume, forming male and female or androgynous spikes. 9. *Carex.*

1. CARPHA R. Br.

Low, grass-like, with *leaves* crowded at the base, and many *spikelets* in a terminal inflorescence with a few long leaf-like *bracts.* *Spikelets* narrow, 1–2-flowered. Hypogynous *setæ* 6, plumose, persisting like a pappus. *Style* 3-branched. *Achene* 3-angled.

Species 2, *C. alpina* R. Br. in Austral., Tasm. & N. Zeal., and the following:

C. SCHŒNOIDES Banks & Sol.

Culms cespitose, to 2 cm. tall, terete, smooth. *Leaves* half as long, semiterete. *Spikelets* about 2-flowered, in a few-spiculate panicle.

(Chili); Patagon., Eden; N. and S. Fuegia, on hills; Desolation I: in W. Magell. (Dusén.)

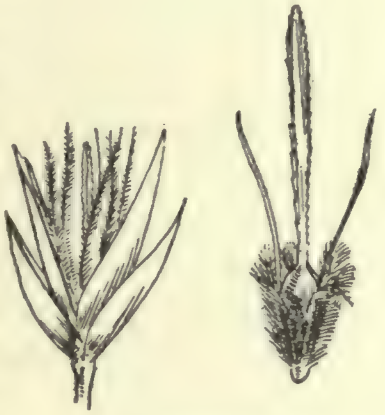

FIG. 44.

Carpha schœnoides. Spikelet and fruit. (From *Flora antarctica.*)

2. CYPERUS Linn.

Culms leafy near the base, with one or more involucrate leaves under the inflorescence. Spikelets mostly flat, in umbellate spikes or heads; at least two of their flowers perfect; their scales 2-ranked. Perianth none; stamens 1–3. (Brit. & Br. i, 235.)

Species 400, in tropical and subtropical regions, chiefly in moist places and near water.

KEY TO THE SPECIES.

a. Culm triangular.
  b. Umbel 1–5-rayed. Bracts 3–4. Achenes fuscescent, punctulate. Awns uncinate. *aristatus.*
  b2. Umbel few-rayed. Bracts 3. Achenes dark-chestnut, punctulate. Culms short; spikes compound. *pœppigii.*
  b3. Umbel 5–8-rayed, rays very short. Bracts 4. Achenes compressed, punctulate. Sides of scales dark- or blood-chestnut. *melanostachyus-variegatus.*
  b4. Umbel 12-rayed. Bracts 6–8. Achenes brown. Tall, with long leaves. *vegetus.*

*a*2. Culm triangular-filiform. Umbel 2–3-rayed. Bracts 2. Achenes blackish. Scales yellowish. *flavus.*

*a*3. Culm compressed. Head lax, 2-bracted. Achenes biconvex. Awn straight, quadrangular. *cimicinus.*

1. C. ARISTATUS Rottb.

Root fibrous, slender, cespitiferous. *Culms* triquetrous, erect, 14 cm., glabrous. *Leaves* linear, carinate, as long as the culm. *Umbels* 1–5-radiate; *rays* unequal, polystachyous; *spikelets* fasciculate-capitate, 8–15-flowered; heads oblong or elliptic-globose. *Involucre* 3–4-leaved, very long; leaves 7–9-nerved, acuminate, awned, the *awns* uncinate, yellow-green; *achene* oblong, triangular, apicate, fuscescent, finely punctulate, one third as long as the scale.

(Orient, Africa, Chili); N. Patagon., in Isla de Crespo, Rio Negro.

2. C. CIMICINUS Presl. (*C. lorentzianus* Bcklr.)

Rhizome small, fibrous. *Culms* 1–few, 15 cm. high, compressed, few-leaved. *Leaves* shorter than culm, complicate, spinulose-toothed. *Head* solitary, lax, with 2-leaved *involucre*. *Spikelets* 5–16, diverging, moderately compressed, linear-oblong; *scales* with lucid castaneous sides; *fruit* minute, scarcely half as long as the scale, compressed-biconvex, obovate, umbo-articulate, reticulate; *rachilla* straight, quadrangular.

(Argentina); N. Patagon., in wet parts along Rio Negro, near Carmen.

3. C. FLAVUS Presl.

Roots fibrous, cespitiferous. *Culms* triangular-filiform, 30 cm. high, leafy at base. *Leaves* very narrow, half as long as the culm. *Involucral* leaves 2, filiform, divaricate, exceeding the simple, 2–3-rayed umbel, with 2–3 spikes, having 14–18-flowered linear-lanceolate, divaricate spikelets. *Scales* ovate-obtuse, 3-nerved, yellowish. *Achene* obovate, subglobose, punctulate, blackish.

(Mexico; Brazil; Argent.); Patagon.

4. C. MELANOSTACHYUS VARIEGATUS Knth.

Style bifid. *Root* fibrous. *Culms* cespitose, ascending, 10 cm., *triquetrous*, leafy at base. *Leaves* plane, linear, glabrous, shorter than the culm. *Umbel* 5–8-rayed, dense with very short rays; *umbellules* 4–6-stachyous; *involucre* about 4-leaved, much exceeding the umbel. *Spikelets* ovate-lanceolate, acute, sessile, 11–15-flowered; *scales* ovate, obtuse, muticous, carinate-navicular, dorsally 5-nerved, olivaceous, and croceous-punctulate, the sides dark or sanguineous-castaneous; keel green, shining. *Achene* ovate-oblong, compressed, apicate, punctulate, half as long as the scale.

(Mexico); N. Patagon., in swamps near Carmen and Tres Cerros.

5. C. POEPPIGII Knth.

Culms cespitose, short (5 cm.) *triangular*, with leafy base. *Leaves* plane, linear, scabrid on margin, exceeding the culm. Involucre 3-leaved, long. *Umbel* simple, few-rayed, fasciculately crowded; *rays* very short, polystachyous; *spikelets* on the rays arranged in compound spikes, linear, compressed, flexuose, about 4-flowered. *Scales* remote, ovate-elliptical, apically rounded, carinate, 7-nerved, dorsally rusty-lined, laterally hyaline-pale. *Achenes* oblong-linear, trigonal, slightly arcuate, mucronate, punctulate, black-castaneous, shining, shorter than the scale.

(Chili.)

C. POEPPIGII PALLESCENS Kurtz.

Pallid-green; the *scales* mostly 1-colored.

N. Patagon., in swamps near Carmen. Pale green plant.

6. C. VEGETUS Willd.

Culm 60–120 cm. tall, trigonal; leaves as long or longer. Umbel 12-rayed; involucre 6–8-leaved, very long. Heads many-spiculate, subglobose. Spikelets 20–40-flowered; scales a third shorter, ovate, acute, 3-nerved, areolate, green or yellowish. Stamen 1. Achene obovate, punctulate, shining brown, trigonal, mucronate, half as long as the glume.

(Chili); Valley of Rio Negro, N. Patagon. (Roca Exp. and J. Ball.)

3. SCIRPUS Linn. Bulrush.

Large or small "sedges" with leafy culms or leafless except the basal sheaths. Scales of the spikelets imbricated all round. Flowers usually perfect; perianth of 6–1–0 bristles. Style not swollen at base. Achene trigonal or lenticular.

Species 200, cosmopolitan.

KEY TO THE SPECIES.

A. Spike solitary.

b. Culm short; root creeping. Spike ovate, few-flowered. Scales ovate, rusty to straw-white. Setæ 6. Style trifid. *albibracteatus.*

*b*2. Culms numerous, cespitose; sheaths mucronate. Spike ovate-oblong to linear. Scales black-purple with green keel. Setæ none. *cernuus.*

*b*3. Culm filiform. Spike oval, compressed. Scales with purplish margin. Setæ 6, two of them shorter than the striate achene. *retroflexus.*

*A*2. Cespitose. Culms filiform, 1-leaved at base, glabrous. Spikes 1–2 (rarely 3–4). Involucre 1-leaved, exceeding the spikes. Scales with white sides having a purple spot. *setaceus.*

*A*3. Unequally umbelliform.

b. Root creeping. Culm tall, leafy below; leaves flat, as long as the culm. Involucre 3–4-leaved. Spikes several, oblong. Scales ovate, bifid, midnerve mucronate-awned. Setæ 2–6, barbed, or none. *maritimus.*

*b*2. Cespitose, tall. Culm filiform, leafy below. Leaves setaceous. Involucre 3-leaved, shorter than the depauperate, 3–5-leaved umbel. *juncoides.*

*b*3. Culm subtrigonal, striate. Involucre 2-leaved, the outer pungent. Umbel many-rayed. Scales elliptical-round, mucronulate. Setæ 2, barbed. *riparius.*

*b*4. Culm leafless, 25 mm. high. Spikes 1–3 in a bracted head. Setæ 6, retrorsely barbed. *deserticola.*

*A*3. Spikes several, bract 1, exceeding them. Scales brown.

b. Culms sharply 3-angled. Scales awned. Setæ 2–3, retrorsely barbed, not exceeding the plano-convex achene. *americanus.*

*b*2. Culms slender, flattened above. Scales acute. Setæ 3, retrorsely barbed, not half as long as the plano-convex achene. *nevadensis.*

*A*4. Spikes in a decompound umbel, with unequal rays. Bracts 3–4. Scales recurved mucronate. Setæ 6, retrorsely barbed. *glaucus.*

1. S. ALBIBRACTEATUS (Nees & Mey. sub *Eleocharis*) O. Ktze.

Root creeping. Culms very short, 25–40 mm. long, setaceous, striate, tetragonal, recurved. Spike ovate, few-flowered; its scales ovate, obtuse, carinate, the sides rusty-red, or all straw-white; the lowest sterile. Setæ 6, whitish. Style trifid. Achene lenticular, punctate-striate, with yellow base, crowned by the persisting style.

(Peru); Patagon.; N. and E. Fuegia.

2. S. AMERICANUS Pers. Three-square.

Perennial by long rootstocks. Culm triquetrous, erect, to one meter tall. Leaves 1–3, narrow, keeled, shorter than the culm. Spikelets oblong-ovoid, in heads, as if lateral. Involucral leaf slender. Scales broad-ovate, brown, emarginate, awned. Setæ 2–6, retrorsely barbed. Stamens 3. Achene plano-convex.

W. Patagon., wet elevations by Rio Aysen.

3. S. CERNUUS Vahl. (including *Isolepis magellanica* Gaud.).

Root fibrous; *culms* numerous, cespitose, 25–40 mm. high. angulate, capillary. *Sheaths* one third as long, ending in a mucro. *Spike* solitary, ovate-oblong to linear, obtuse, many-flowered. *Scales* ovate, the lowest acute, the others obtuse, black-purple with green keel. *Setæ* none. *Achene* obovate ("triquetrous," Speg.).

(E. Hemisphere); Magellan; rather common in Fuegia.

S. CERNUUS PYGMÆUS (Kunth sub *Isolepis*).

Scales carinate-navicular, broad, obtuse, mucronulate, their sides hyaline-white. *Achene* subrotund, flat inside. No perianth-bristles.

S. Patagon., Beagle Channel. (Dusén.) "Has two forms, *brevis* and *elongatus*." (Wiegarht.)

4. S. DESERTICOLA Phil.

Creeping, cespitose; *culms* covered by castaneous sheaths, 25 mm. high, leafless. *Leaves* rosulate, plane, striate. *Spikes* 1–3, forming a terminal head. Lower bracts ovate, 5-nerved, apically coriaceous, greenish, equalling the head; others shorter, narrower, scarious. *Setæ* 6, hypogynous, retrorsely hispid. *Achene* ovate, triquetrous, acuminate, smooth, scarcely half as long as the scale.

(Desert of Atacama; Mendoza); S. Patagon. by Rio Chico.

5. S. GLAUCUS Nees.

Glaucous. *Culm* triangular, glabrous, leafy below, rough on the angles at the top. *Leaves* plane, carinate, scabrous on the angles and margin, almost equalling the culm. *Involucre* 3–4-leaved, longer than the supra-decompound cymiform *umbel*. *Rays* very unequal; raylets apically 1–5-ranked, cylindraceously oblong. *Scales* carinate, oblong, apically recurved-mucronate and ciliolate, fuscescent with a green keel. *Achene* round-elliptical, attenuate, long-mucronate. *Setæ* 6, retrorsely spinulose.

(Chili); Patagon., Neuquen, in damp places.

6. S. JUNCOIDES Willd. (*Isolepis junciformis* H. B. & K.)

Culm cespitose, tall, 45 cm., strict, filiform, striate, rigid, glabrous, leafy at base. *Leaves* setaceous, canaliculate, shorter than the culm. *Involucre* 3-leaved, shorter than the depauperate 3–5-rayed *umbel;* the *rays* unequal, 1, rarely 2- or 3-headed, the heads globose, many-spicate; the *spikes* ovate; scales carinate-navicular, 3-nerved, brownish. *Achene* trigonal-obovate.

(Brazil, etc.); N. Patagon.

7. S. MARITIMUS Linn.

Root creeping. *Culm* stout, 30–90 cm. tall, trigonal, erect, glabrous or scabrous on the angles upwards, leafy below. *Leaves* flat, linear, as long as the culm, rough-edged. *Involucre* 3–4-leaved, 1 or 2 leaves longer than the others. *Umbel* simple, few-rayed, the rays unequal or all short. *Spikes* oblong, 6–18 mm. by 4–6 mm., many-flowered. Scales ovate, apically bifid, acuminate, mid-nerve excurrent-awned, brown-rusty. *Achene* obovate plano-convex, finely tuberculate. *Setæ* 2–6, short, retrorsely spinulose, or none.

(Cosmopolitan); N. Patagon., "common at Tuy and elsewhere. Sometimes used for thatching." (J. Ball.) At Rio Chico de la Sta. Cruz, by J. B. Hatcher; in fruit, March 24, 1897.

8. S. NEVADENSIS S. Wats.

Stems clustered from a running rootstock, 30–60 cm. high, slender, leafy at base, somewhat flattened above. *Leaves* nearly as long, channeled or revolute, rough on margin, acute. *Spikelets* 1–8, ovate-oblong, acute, 8–20 mm. long, in sessile clusters, subtended by a single, erect, involucral leaf. *Scales* brown, shining, ovate, subcarinate, acutish. *Setæ* 1–3, retrorsely barbed, not half as long as the broad-ovate, plano-convex, acute *achene*, 2 mm. long. Style 2-cleft.

(Nevada); S. Patagon., in wet salinas near Rio Chico.

9. S. RETROFLEXUS Poir. (*S. setaceus* Nees non L., *Heleocharis chætaria* R. & S.)

Culm filiform, glaucous. *Spike* solitary, compressed, oval. *Scales* obtuse, their margin thin-purplish, dorsally green-carinate; the 2 lower subequal, shorter than the spikelet. *Setæ* 6, brownish, 2 of them shorter than the obovate, trigonal *achene*, which is punctate-striate, with rostrum dilated.

(East Indies); N. Patagon.

10. S. RIPARIUS Presl.

Culm obtusely trigonal, finely striate. *Involucre* 2-leaved, the outer *leaf* straight, pungent, continuing the culm, shorter than the umbel, the inner leaf still shorter. *Umbel* many-rayed, its rays trigonal. *Bracts* lanceolate, 1-nerved. *Spikes* ovate-oblong, many-flowered. *Scales* elliptical-round, 1-nerved, emarginate-mucronulate. *Setæ* 2, retrorsely scabrid. *Style* bifid. *Achene* obovate, plano-convex.

(Calif. to Chili); N. Fuegia, rare, Dusén; abundant on the banks of Lago Nahuel-huapi.

S. RIPARIUS TERETICULMIS Steud.

Approaching *S. americanus* by its more or less terete, flavescent *culms*, 25–75 cm. high, finely striate, its depauperate *umbel*, about 6-rayed, its sanguineous *bracts*, its smaller dark sanguineous *spikes*, its broad-ovate, long-awned *scales*. *Style* long, bifid.

S. Patagon., by banks of Pavon I., in Rio Sta. Cruz, and Lago Argentino.

11. S. SETACEUS Linn. p. p.

Culms cespitose, filiform, 1-leaved at base, glabrous; the *leaf* linear-filiform, shorter than the culm. *Spikes* solitary or in pairs, rarely 3 or 4, ovate, obtuse, few-flowered. *Involucre* of 1 leaf, exceeding the spikes. *Scales* ovate, submucronate, green at the keel, hyaline-white with a purple spot at each side. *Achene* round-elliptical mucronate, its sides ribbed lengthwise and striate across.

(Eurasia, Austral., Chili); Magellan.

4. HELEOCHARIS (*Eleocharis*) R. Br. Spike-rush.

Sedges with simple *culms*, the *leaves* usually reduced to sheaths. *Spikelet* solitary, terminal, erect, many-flowered, not involucrate. *Scales* concave, imbricated spirally. *Perianth-bristles* 1–8, retrorsely barbed, or none. *Stamens* 2–3. Style 2–3-cleft, its base enlarged and persisting as a rostrum on the lenticular or trigonal *achene*.

Species 80, cosmopolitan, from tropics to the arctic regions.

KEY TO THE SPECIES.

a. Style usually 2-cleft.
  b. Low, creeping by thick rootstock. Stylo-base constricted. Setæ none–3. *funebris*.
  b2. Creeping horizontally; stout. Achene with flat rostrum. Setæ 4 or none. *palustris*.

*b*3. Slender. Spike oval, 1-bracted. Achene 2-edged. *uniglumis.*
*b*4. Style bifid or trifid. Setæ rigid, persisting. Bulb rugose. Spike terminal. *sulcata.*
*a*2. Style 3-cleft.
b. Stems minute, setaceous. Flowers distichous. Setæ 2–4. *acicularis.*
*b*2. Stems filiform.
c. Spike solitary, bractless, dark purple. Achenial bulb conical. Setæ 3–4–(6). *melanocephala.*
*c*2. Spike sublateral, with bract-like scale. Style trifid less than half-way; bulb as broad as the achene. *pachycarpa.*
*a*3. Achene transversely striate. Culm triangular-filiform. Setæ 3–4. *striatula.*

1. H. ACICULARIS Roem. & Sch.

Stems setaceous, almost round; sheaths leafless. Spike ovate, acute. Glumes equal, acute. Stigmas 3. Setæ 2–3.

H. ACICULARIS LILLIPUTIANA Speg.

Cespitose, with small *culms*, 5–10 mm. long, quadrangular, green, purplish-sheathed at base; *spikes* acrogenous, 4–7-flowered, flowers distichous, *scales* ovate-elliptical, obtuse, entire. *Setæ* 4, retrorsely spinulose.

Patagon., in river swamps near Golfo de San Jorge.

2. H. FUNEBRIS Speg.

Rhizome thick, creeping. *Culms* low, densely fasciculate-cespitose, the fertile and sterile intermixed; terete or subangulate, scarcely sulcate, smooth, green, leafless, sheathed at base; *sheaths* wine- or dark-purple-colored below, pallid upwards, obliquely truncate and submucronulate. *Spike* strictly acrogenous, fusoid-subovate, many-flowered; *scales* ovate, acutish, obsoletely 1-nerved, often dorsally green and marginally dark-purplish. *Stamens* 3, minutely mucronulate, with none–3 slender, retrorse setæ, just surpassing the ovary. *Style* cleft from the middle, moderately bulbose-thickened at base. *Achene* obovate, ventrally flat, dorsally convex; stylar-bulb persisting with a constriction below, fuscous-yellow, smooth, or obsoletely reticulate-punctulate.

S. Patagon., in swampy elevations near Rio Carren-leofú.

3. H. MELANOCEPHALA Desv.

Small, handsome, creeping, with filiform *culms*, 2.5–5 cm. high, strict, often curved, leafless, sheath purple. *Spike* black-purple, solitary, bractless, ovate-acute, 3–7-flowered. *Scales* ovate-obtuse, concave-carinate, 1-nerved, never green nor reaching the apex. *Setæ* 3–6, shorter than the achene. *Stamens* 3, anthers linear, obtusely appendaged. *Style* apically 3-cleft, its divisions thick. *Achene* half as long as the scale, triangular, obovate-elliptical, punctulate. *Tubercle* conical.

(Andes); S. Patagon, along Rio Sta. Cruz, in swamps.

4. H. PACHYCARPA Desv.

Creeping. *Culms* filiform, erect, quadrangular, 7–25 cm. high, *Spike* sublateral, many-flowered, ovate-obtuse with lower scale ovate-acute, bract-like. *Scales* ovate, subcarinate, lax, 1-nerved, black-sanguineous, scarious on margin and top. *Style* trifid less than half way, its divisions thick. *Achene* trigonal, thick, lutescent, truncate. *Tubercle* very large, conical, mostly broader than the achene.

(Chili); a form in S. Patagon. (by O. Nordenskjöld).

5. H. PALUSTRIS R. Br.

Culm stout, nearly terete, striate, about a meter tall. *Spike* thicker than the culm, oblong-lanceolate, many-flowered. *Scales* white-bordered, with green keel. *Bristles* usually 4, sometimes none. *Achenes* narrow-obovate, rostrum flattened.

(Eurasia; N. Amer., Brit. & Br. i, 251.) Patagon. by Rio Chico and Carren-leofú; Falklands.

6. H. STRIATULA Desv.

Creeping. *Culm* erect, flaccid, 7–20 cm. high, filiform, quadrangular, smooth, sheathed at base, leafless. *Spike* several-flowered, lanceolate, elongate. *Scales* ovate, concave, obtuse, dorsally green, laterally blood-red, 1-nerved, the nerve not to the apex. *Setæ* 3–4. *Stamens* 3, anthers long, obtusely mucronate. *Achene* elliptical, costate, transversely striate, pallid, with a small conical tubercle on top.

(Chili); S. Patagon., by Rio Sta. Cruz.

7. H. SULCATA Nees.

In the group having the perigynial *setæ* rigid, persisting; *style* bifid or trifid; bulb or stylobase suberose, rugose, persisting, Achene obovate, biconvex. Spicule solitary, terminal.

(New Mexico.)

H. SULCATA FILICULMIS (Schrad.) Kurtz.

N. Patagon., swamps near Carmen.

8. H. UNIGLUMIS Link.

Culm from a stoloniferous base, erect, gracilescent, scarcely exceeding 30 cm.; *sheaths* apically ustulate, lacerous. *Spike* oval, bract single, subrotund, with its base embracing the whole spike. *Scales* oblong, rather obtuse, fuscescent, with a green keel. *Achene* 2-edged; *style* bifid, with a very thick base, not corrugate.

(Eur.; N. Amer.); S. Patagon., swamps between S. Julian and Rio Deseado.

5. STENOPHYLLUS Raf.

Annual sedges, with slender, erect *culms*, and basal linear-filiform *leaves* having hairy sheaths. *Spikelets* in umbels or heads, or solitary, with a 1–3-leaved *involucre*, and scales oblong, spirally-imbricated. *Perianth* none. *Stamens* 2–3. *Style* 2–3-cleft, its base persisting as a tubercle on the trigonal *achene*.

Species 20, in warm and temperate regions.

S. CAPILLARIS (L. sub *Scirpus*) Brit. (Gray sub *Fimbristylis*).

Culms 15 cm. high and *leaves* tufted, filiform, shorter than the culms. *Spikelets* several or only 1, often panicled, ovoid-oblong. *Stamens* 2; styles 3-cleft. *Achenes* yellow-brown, wrinkled across, larger upwards.

(N. and trop. Amer., Brit. &. Br. i, 258); N. Patagon.

6. OREOBOLUS R. Br.

Dwarf cespitose, with distichous *leaves* and a single 1-flowered terminal *spikelet* (rarely 2 spikelets) terminating the erect peduncle. *Glumes* 3. *Perianth* represented by 6 narrow, rigid, subequal, hypogynous scales, which persist like a pappus. *Achene* smooth, ovoid, with no rostrum.

Species 3, in S. Austral., Tasman., N. Zeal., Hawaiian Is., S. Amer.

1. O. OBTUSANGULUS Gaud. (*O. pumilio* R. Br.)

Culm sharply trigonal, covered below; the *leaves* linear. *Scape* axillary, short, compressed, 1-flowered.

(N. Zeal., Tasman., S. Austral., Chili, etc.), W. Magellan, Port Eden; Fuegia to Cape Horn; at Packewaia in Beaver Ch.; Staaten I.; Falklands, abundant.

(Fig. G–H in Engl. & Pr. ii, 2, 114.)

7. ELYNANTHUS Nees.

Low or rush-like, with narrow leaves and few-flowered spikelets, the upper flowers male, the lateral hermaphrodite; several sterile scales distichously imbricating the base of the spikelets, which form a close or lax panicle. Stamens 3, rarely more, to 8. Style 3-branched, broad at base. Achene broadly ellipsoid, obtusely triangular, the angles costate.

Benth. & Hook. Gen. Pl. iii, 1063, distinguish these from *Schœnus* by their terminal panicles, non-flexuous rachis, habit and nut.

Species 30, chiefly in S. Afr., with scattered species in S. Austral., New Zeal., and extra-trop. S. Amer.

1 E. **ANTARCTICUS** (Hook. f. sub *Chætospora*).

Culm cespitose, terete, leafy at base, leaves narrow-linear, rigid, scarcely equalling the culm, semiterete, glabrous. Spikelets 1-flowered; about 6 of them in a short panicle, shorter than the 5-leaved involucre. Scales distichous, keeled, unbearded. Setæ 6, capillary, exceeding the achene.

(Mts. of S. Chili); Cape Tres Montes; N. & S. Fuegia; W. Magellan. (Dusén.)

2. E. **LAXUS** (Hook. f. sub *Chætospora*).

Culm 30–60 cm. tall, cespitose. Leaves about as long, only 1 mm. wide, striate, margins serrulate. Panicle lax, 6 cm. long, with longer bracts, the pedicels 1-spiculate. Spikelets 2-flowered, with 5 scales, the highest with a male, the next with a

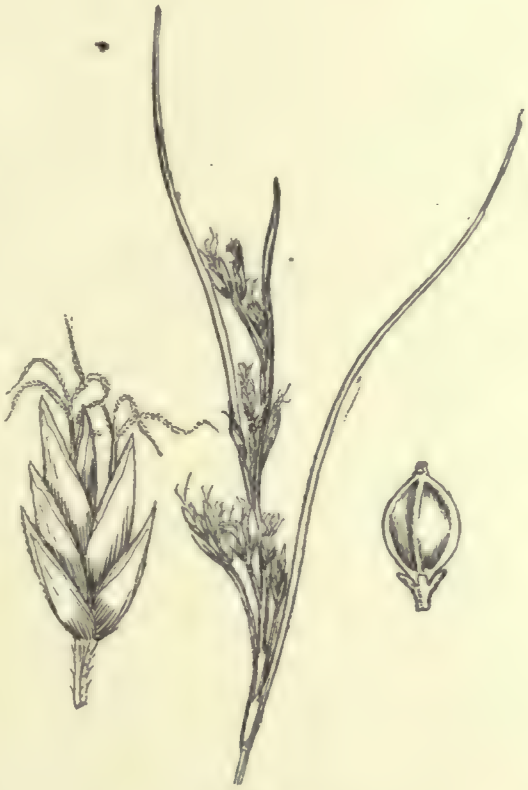

FIG. 45.

Elynanthus laxus. Inflorescence, spikelet and achene. (After Franchet.)

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perfect flower. Perianth of 4–6 setæ, persisting, and exceeding the achene.

(S. Chili.) Patagon.(?).

3. E. SODALIUM (Hariot) Franchet.

Culm 30 cm. tall, the leaves shorter, their apex pungent, their sheaths and the scales of the 1-flowered spikelets black. Panicle contracted, 10–12-spiculate. Perigonial setæ (12?), slender, persisting, exceeding the ovate achene and its 3-branched style.

Fuegia, forming peat near Cape Horn, and subalpine in Navarino I. in Beagle Ch.

8. UNCINIA Pers.

Spike simple, terminal, monœcious, its scales imbricated with numerous *male flowers* in each of the upper scales, and solitary *female flowers* in the lower. *Scales* not keeled; the *achene* enclosed in a utricle, at the base of a slender axis which usually protrudes as a "*seta*" or "awn" and usually ends in a hook.

Species 30, mostly southern, in Austral. and N. Zeal.; one in Fernandez; and the following.

KEY TO THE SPECIES.

- *A.* Smooth.
  - *b.* Culm thick at base; leaves longer, linear. Awn-protrusion as long as the utricle.
    - *c.* 7 cm. Scales whitish. Awn-extension reddish, ciliate-edged. *phleoides.*
    - *c2.* 60 cm. Scales white-margined. Utricle shining. *macrophylla.*
  - *b2.* Culm slender, 90 cm. tall. Leaves large, flat. Spike large, cylindrical; scales white-margined upwards. Awn-protrusion half as long as the apically pilose utricle. *cylindrica.*
  - *b3.* Culm stoloniferous, crowded-leafy at base. Scales hyaline-margined.
    - *c.* Leaves setaceous, shorter than the culms. Awn straight. *microglochin.*
    - *c2.* Leaves narrow, plicate. Awn-protrusion (twice?) as long as the utricle, yellow. Culm 20 cm. *sinclairii.*
- *A2.* Smooth, save the scabrid edges and mid-nerves of the leaves.
  - *b.* Cespitose, creeping, 7 cm. Leaves narrow, involute. Spike capitate, naked. Scale lanceolate, pale-nerved. Awn-protrusion half as long as the utricle. *kingii.*
  - *b2.* Culm simple, 30 cm. tall, leafy below. Leaves linear. Spike 1-bracteate. Scale-margins rusty. Awn-protrusion as long as the rough-edged utricle. *macloviana.*
  - *b3.* Root thick; culm 45 cm. high. Leaves plane, flaccid, as long as the culm. Spike lax. Scale-margins brown, smooth. Awn-protrusion as long as the apically setulose utricle. *lechleriana.*
  - *b4.* Robust; culms 75 cm. tall. Leaves broad-linear, as long. Spike thick, cylindrical. Awns 6 times as long as utricles, projecting all around. *macrotricha.*

*A*3. Scabrid.

b. Culm 30 cm., leafy below, rough above. Leaves shorter, linear. Spike lax, depauperate. Scales marginally white-hyaline, glabrous. Awn-protrusion twice as long as utricle. *tenuis*.

*b*2. Culm 36 cm. tall, leaf-remains at base. Leaves as long, flat. Spike with 3 bracts. Scales pale-fuscous, 7-nerved. Utricle lanceolate, glabrous. Style thickened at base. *bracteosa*.

*b*3. Culm 60 cm., filiform, sheathed at base. Leaves shorter, flat. Scales sanguineous. Awn-protrusion as long as the utricle. *triquetra*.

1. U. BRACTEOA Phil.

Culm 36 cm. tall, scabrid above, base with remains of old leaves; *leaves* as long, 4 mm. broad. *Spike* oblong, 40 by 15 mm., lax, with 3 involucral leaves, one of these 3 times its length. *Female* scales spreading, lance-ovate, the lowest 10 mm. long, pale-fuscous, dorsally green, 7-nerved. *Utricle* lanceolate, glabrous. *Achene* ovate-oblong, truncate; style thickened at base.

Smith Channel of W. Patagon.

2. U. CYLINDRICA Franchet.

Culm 90 cm. tall, slender, smooth; *leaves* large and flat, 6 mm. broad. *Spike* 10 cm. long, slender, cylindrical, shortly male at the obtuse apex. *Scales* firm, concave-ovate, glabrous, white-margined upwards. *Utricle* oblong-fusiform, obtuse, many-nerved on the convex back, ventrally plane, pilose at top and on margins, equalling the scale, 5 mm.; *awn* a half longer. (Fig. 47, right side, p. 271.)

Fuegia, Molyneux Harbor, in woods.

3. U. KINGII Boott.

Cespitose, root creeping; *culm* 8 cm. high. *Spike* capitate, naked. *Utricle* lanceolate, narrowing upwards, its mouth truncate, obliquely cleft, its surface ferruginous, smooth, exceeding the pale-nerved lanceolate scale. *Awn* half longer than utricle. (Fig. 46.)

W. Magellan, S. Fuegia, alpine by Rio Grande on Beagle Ch. (Dusén); at Port Cook (Speg.).

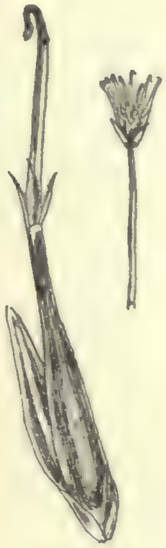


FIG. 46.

Uncinia kingii. Spike and spikelet showing its scale, utricle, and awn. (From *Flora antarctica*.)

4. U. LECHLERIANA Steud.

Root fibrous, thickened. *Culm* erect, round-angular, 45 cm. tall, sheathed below. *Leaves* as long, flat, margins rough. *Spike* lax, with leafy scales at base, attenuate, male above. *Scales* oblong, obtuse, pale, the edge brown, glabrous, exceeding the oblong-triquetrous, apically setulose utricle. *Awn* hooked, exserted part as long as its utricle.

Magellan, Fuegia, on Beagle Channel.

5. U. MACLOVIANA Gaud.

Culm simple, erect, 30 cm. high, trigonal, glabrous, the base leafy. *Leaves* plane, erect, rigid, linear, rough inside and on edges. *Spike* slender, erect, cylindrical, 4–5 cm. long, with a basal setiform leaf. *Utricle* lance-oblong, plano-convex, 1-nerved, the angles ciliate-rough, equalling the obtuse scales. *Awn* twice as long, hooked.

(Montevideo); Magellan; Falklands; Fuegia, near woods.

U. MACLOVIANA MONTANA (Phil.).

Smaller than *U. macloviana* Gaud., its leaves shorter, subapically toothed. Spicule extremely attenuate, 18 mm. by 2.5 mm. Scales similar in male and female, orbiculate-ovate, utricle oblong-oval.

S. Fuegia. (O. Nordenskjöld.)

6. U. MACROPHYLLA Steud.

Root very fibrous, its neck thickened by sheaths of old leaves. *Culm* erect, triquetrous, smooth, glabrous, firm, leafy at the base, 60 cm. high. *Leaves* plane, 2–4 mm. broad, and much overtopping the culm, acuminate. *Spike* cylindric, 7 cm. long, by 12 mm. thick, naked at base, apical cone male. *Scales* fuscous, with whitish margin, the lower exceeding the obtusely triquetrous, oblong, shining utricle. *Seta* uncinate, the exsert part as long as the utricle.

(Chili); W. Patagon.

7. U. MACROTRICHA Franchet.

Culm robust, 75 cm. tall, trigonal, rough-edged. *Leaves* as long, broad-linear, smooth save on margin. *Spike* thick-cylindrical, attenuate upward, acute. *Scales* oblong, obtuse, half as long as the utricles, pallid.

Utricle gray, broad-obovate, rostrate, incurved-refract in middle. *Awn* 6 times as long, hooked, extending outwards. (Fig. 47, left side.)

Patagon., Otway.

8. U. MICROGLOCHIN (Wahl. sub *Carex*) Sprengel.

Rhizome stoloniferous. *Culm* 10–15 cm. high, smooth, terete, sulcate, leafy at base. *Leaves* strict, setaceous, much shorter than culm. *Spike* naked, 1 cm. long; male part 5–6-flowered; female part 4–12-flowered. *Scales* oblong, at length chestnut-colored; the dorsal nerve clearer, margin hyaline; *scales of female* flowers ovate-oblong, obtuse, soon deciduous, involving the utricles, which are 5 mm. long, green, becoming brown, terete. *Achene* with a straight, setaceous, exsert awn. Stigmas 3.

(Arctic and alpine parts of N. Hemisphere); Fuegia to Cape Horn.

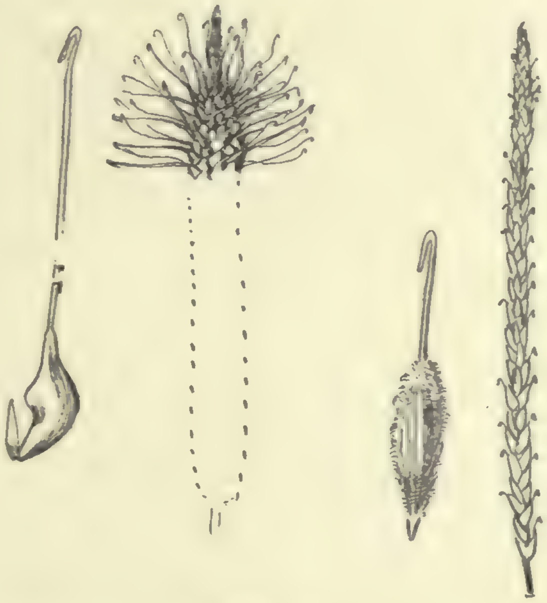


FIG. 47.

Uncinia macrotricha (2 figures on left), top of spike and achene; *Uncinia cylindrica* (2 figures on right), spike and utricle. (After Franchet.)

U. MICROGLOCHIN FUEGIANA (Kükenthal). (*Carex oligantha* Boott. non Phil., etc.)

Taller and stouter. *Spike* few-flowered, about 2–3 male flowers and 3 females. *Utricles* 6 mm. long, deflexed. *Stipe* more conspicuous.

S. Patagon.; W. Magellan, Fuegia to Orange Harbor and Horn I.

9. U. PHLEOIDES Pers.

Culm thick at base, smooth, 7 cm. high. *Leaves* longer, broad-linear. *Spike* 10 cm. long, pallid, basiattenuate. *Scales* lax, the female obovate, whitish, rusty-zoned. *Utricle* 8 mm. long, oblong-linear, attenuate both ways; its edges ciliate. *Awns* 6 mm. long. Achene obtuse-angled, pale.

(S. Chili; "Quin-quin"); Patagon.(?)

U. PHLEOIDES BRACHYTRICHA Speg.

Leaves scarcely equalling the culm, plane or plicate, not scabrid. *Culms* scarcely leafy at base. *Awn* slightly exsert, 10 mm. long.

Patagon., Chubut.

U. PHLEOIDES LONGISPICA Franchet.

Culms 30–60 cm. tall, glaucescent. *Leaves* exceeding 30 cm., by 8 mm. broad. *Spike* dense, from a linear, attenuate base, with clavate apex, 9–18 cm. long. *Utricle* red-tomentose above.

S. Patagon., Otway.

10. U. SINCLAIRII Boott.

Rhizome stoloniferous. *Culm* 5–25 cm. high, rather curved, smooth, obtuse-angled. *Leaves* crowded at base, narrow, plicate. *Spike* narrow-oblong, 1–2 cm. long, rather dense; *male* part the shorter; *female* scales ovate, obtuse, straw-brown, dorsally many-nerved, margin hyaline. *Utricle* just exceeding the scales, 4 mm. long, ovate, attenuate both ways; hispid next the short rostrum. *Achene* ovate, trigonal. *Awn* yellow, twice as long as the utricle.

(New Zealand); Fuegia by Rio Azopardo. "The Fuegian plant has taller culm and shorter male part of the spike than the N. Zeal. plant." (Dusén.)

11. U. TENUIS Poeppig.

Creeping, slender; *culm* leafy at base, rough at top. *Leaves* shorter than culm, linear, rough-edged. *Spike* slender, lax-flowered, depauperate. *Scales* ovate, acuminate, 1-nerved, the lowest awned, articulate, deciduous, except the saccate base. *Utricles* elliptical, attenuate both ways, plane or obtuse-angled, glabrous, truncate; their *awn* long-hooked, twice the utricle in length.

S. Patagon., by Cabo Negro and Punta Porpesse; Fuegia, Ushuaia; Cape Horn.

12. U. TRIQUETRA Kükenthal.

Rhizome cespitose. *Culm* 60–70 cm. high, strict, filiform, obsoletely triquetrous, scabrid upwards, base covered by brown sheaths. *Leaves* shorter than the culm, 3 mm. broad, plane, very green. *Spike* 4–6 cm. long, lax-linear, *male* part short, scales oblong, obtuse dorsal nerve green, not reaching the apex; *female* scales longer, blood-red. *Utricles* exceeding the scales, 7 mm. long, elliptical-trigonal, greenish, obsoletely nervous, with short rostrum. *Achene* oblong. *Awn* glabrous, twice as long as the utricle.

W. Fuegia; Beagle Channel, by Rio Olivaia.

9. CAREX Linn. Sedge.

Grass-like herbs, usually with trigonal culms, sheathed by the closed base of the 3-ranked leaves. Flowers monœcious or diœcious, solitary in the axils of scales, without true perianth, forming spikes which are subtended by the upper leaves, and are wholly male, or wholly female, or with the flowers androgynously mixed in the same spike. Stamens 3, rarely fewer. Style-branches 2 or 3. Achenes trigonal or lenticular, enclosed in a utricle.

Species more than 1,000, cosmopolitan, most abundant in temperate zones, often cespitose and forming tussocks in marshy places.

CAREX ANALYSIS, FOR SPECIES OF SOUTH AMERICA.

(Based on Kükenthal in Engler's Bot. Jahrb. xxvii, 558.) The species reported from Patagonia have their numerical position prefixed.

1. Spike 1, androgynous. 2.
   Spike 1, subglobose, male above, female below, with long bracts. Leaves filiform, half as long as the culm. (28) *C. ortegæ.*
   Spikes numerous. 12.
2. Spike directly terminal. Stigmas 2–3. 3.
   Pseudolateral. Stigmas 3. 6.
3. Stigmas 3. Spikes 5–6-flowered. Utricle terete, subulate. Achene with an exsert seta. (Sub *Uncinia*, p. 271) *C. microglochin fuegiana.*
   Stigmas 2. Utricle plano-convex. 4.
4. Rhizome creeping. Spike few-flowered; scales acute. *C. trichodes.*
   Rhizome deep, sending up many low, angulate-terete, sulcate culms. Diœcious, male spike solitary, female spikes few. Utricle convex-concave with long rostrum. (37) *C. subantarctica.*
   Rhizomes cespitose. Spike many-flowered, obtuse. 5.
5. Scales round, persistent. Utricle broad. *C. capitata.*
   Scales ovate, caducous. *C. caduca.*
6. Spike 1, pseudolateral. Stigmas 3.
      Culm low, leafy. Rostrum long. *C. vallis-pulchræ* Phil.
      Culm taller. Fruit suberostrate. 7.
7. Culm triquetrous, weak. Leaves plane. Utricle winged. *C. sellowiana.*
   Culm subterete, smooth. Leaves not plane, few. Utricle not winged. 8.
8. Culm thick, leafless. 9.
   Culm slender, leafy. 10.

9. Basilar sheaths mediocre. Bract half as long as spike. Female scales obtuse, deciduous. (3) *C. aphylla.*
Basilar sheaths large, the upper produced. Bracts twice as long as spike. Female scales acute, persistent. *C. molinæ.*
10. Rhizome cespitose. Culms all flowering. Leaves reduced. *C. berteroani.*
Rhizome bearing also sterile culms. Leaves developed. 11.
11. Culm rigid, exceeding the rigid leaves. Spike globose, many-flowered. *C. andina.*
Culm slender, nearly hid in sheaths. Spike subglobose, few-flowered. (29) *C. patagonica.*
12 (from 1). Spikes numerous.
Spikes sexually mixed. 13.
Spikes sexually distinct. 37.
13. *Hyparrhene.* Spikes basally male. 14.
Acrarrhene. Spikes apically male. 16.
14. *Hyparrhenæ.*
Spikes crowded into a head. Utricle winged, long-rostrate (Uncinia). (26) *C. leporina* L. (*C. macloviana* d'Urv.).
Spikes 5–6, ovate, contiguous. Utricle plano-convex, margined. Rostrum 2-toothed. (31) *C. propinqua* N. & M.
Spikes remote. Utricles short-rostrate. 15.
15. Scales white. Spikes small. Utricles not winged. (9) *C. canescens* L. or (36) *similis* d'Urv.
Scales blackish. Spikes larger. Utricle spinulose-winged. (4) *C. atropicta* Steud.
16. *Acrarrhenæ.*
Spikes more or less sessile. 17.
Spikes 4, upper one androgynous, lower female and stalked. Stigmas 2. (25) *C. lechleri.*
Spikes long-stalked. 31.
17. Spikes remotish, short-petioled, long-bracted. *C. uruguensis.*
Spikes crowded in a head. 18.
18. Head involucrate. Rostrum incurved. 19.
Head exinvolucrate. Rostrum straight. 23.
Head with a long leafy bract: rostrum cleft. (13) *C. divisa* Huds.
19. Sheath cross-wrinkled. Spike long, compound. *C. brongniartii* Kth.
Sheath smooth. Spike short, simple. 20.
20. Utricles tubercled, nervose, and spongiose. (6) *C. bonariensis* Dsf.
Utricles smooth. 21.
21. Spike oblong. Utricle nervose, spongiose. (7) *C. bracteosa* Ktze.
Spike ovate or ovate-oblong, not very nervose. 22.
22. Spike 2 cm., crass. Utricles green-margined. *C. soraira* Kth.
Spike 1 cm., less crass. Utricles green- or fulvous-margined. (23) *C. involucrata* Bt.
23 (from 18). Head long. Utricle narrow, ciliate-margined. Rostrum long. Culm hid among leaves. *C. reichii* Krk.
Head ovate or triangular. Utricle broader, not ciliate-margined. 24.
24. Utricle membranaceous, not crass. 25.
Utricle suberose-incrassate. 26.
25. Culm terete, compressed, incurved. Leaves plicate, not thick. Spike globose, ovate, male flowers generally concealed. Scales broad-ovate, mucronate. (22) *C. incurva* Lightf.

Culm obtusely triquetrous. Leaves subterete, thick. Spike oblong, male part conspicuous. Scales ovate-lanceolate, acute. *C. melanocystis* Desv.

26. Utricles coriaceous, margined, not winged. 27.

Utricles membranaceous. Wings crass at margins. 30.

27. Spikes compound. Rostrum rough, more or less incurved. *C. marcida* Bt.

Utricle dorsally convex. Rostrum straight. 28.

28. Utricle small, 2 mm. high, spongy. Spikes often unisexual. (18) *C. gayana* Dsv.

Utricle longer, thicker. Spike androgynous. 29.

29. Culm rough above. Spikes compound. Utricle not stiped. *C. macrorrhiza* Bt.

Culm smooth; spikes simple. Utricle stiped. *C. hypoleucos* Dsv.

30 (from 26). Culm compressed-trigonal, rough upwards. Utricle 4 mm., ovate, attenuate-stipitate, 2-toothed, with long rostrum. *C. pycnostachya* Dsv.

Culm thick, smooth. Utricle 3 mm., glabrous, ovoid, winged, stiped. (24) *C. kurtziana* Kük.

31. *Spikes long-pediceled.*

(From 16.) Spike of few, simple, rarely compound, spikelets. 32.

Spikes 10–12, upper 4 male, lower ones long-stalked. Stigmas 2. Rostrum 2-toothed. Bracts exceeding culm. (20) *C. incompta.*

Spike paniculate, of many spikelets. 35.

32. Lateral spikelets subbasilar. Utricle pyriform. Stigmas 3. 33.

Lateral spikelets subterminal. Utricles plano-convex. Stigmas 3. 34.

33. Rhizome laxly cespitose. Spike clavate. Scales whitish. *C. phalaroides* Kük.

Rhizome densely cespitose. Spikes scarcely cespitose. Scales pubescent. *C. macella* Kth.

34. Spikes slender, laxiflorous. Utricles elliptical, not as long as the scales. *C. pichichensis* Hum.

Spikes crass, densiflorous. Utricles broad-ovate, equalling the scales. *C. brunnescens* Bck.

35 (from 31). Panicles divaricate. Utricle green, red-spotted. Stigmas 2. *C. seditiosa* Steud.

Panicle contracted. 36.

36. Secondary panicles interrupted. Utricle 3.5 mm., planoconvex. Stigmas 2. *C. catamarcensis* Clk.

Secondary panicles contiguous. Utricles 2.5 mm., trigonal-globose. Stigmas 3. *C. latibracteolata* Kük.

37. *Spikes sexually distinct.*

(From 12.) Terminal spike basally male; laterals only female. Stigmas 3. *C. boliviensis* var. H. & M.

Spikes 3, short, males at base and sometimes at apex, the lower stalked and bracted. Utricle compressed. (16) *C. fuegiana.*

Terminal spikelet typically male; laterals female. 38.

38. Utricles entire or brevirostrate. 39.

Conspicuously rostrate and 2-toothed. 45.

39. Stigmas 2. 40.

Stigmas 3. 43.

40. Leaves narrow-involute. Basal sheaths leafy. Spikes subsessile, single. Scales obtuse. 41.

Sheaths leafless. Leaves broad, plane, revolute. Spikes long-stalked, in 2's and 3's. Scales acutish. 42.

Sheaths leafless. Spicate glomerules. (34) *C. schedonautos.*

41. Bracts shorter than culm. Spikes few, oblong-cylindrical, or short. Utricles subsessile, nerveless. Achene nearly filling the utricle. *C. vulgaris* Fr.

Bracts longer than culm. Spikes many, cylindraceous. Scales soon deciduous. Utricles stiped, nervose. Achenes scarcely filling two thirds the utricle. (12) *C. decidua* Bt.

42. Spikes approximate, only the lower stalked. Scales scarcely elongate. Utricles many-nerved. (2) *C. andersoni* Bt.

Spikes remote, numerous, all stalked. Scales elongate. Utricles granulose-punctate, few-nerved. (11) *C. darwinii* Bt.

43. Culm low, concealed in the leaves. Female spikes oblong, lax. Rostrum short, often recurved. *C. brachycalama* Gris.

Culm medium, leaves as long. Lower spikes nodding. Utricles elliptical. (19) *C. germana.*

Culm exceeding the leaves. Male spike 1, female spikes about 4, little remote. Utricles ovate-oblong. (17) (*indecora*) *C. fuscula.*

Culm tall, free. Spikes distant. Utricles compressed-triquetrous. 44.

44. Culm acute-angled, rough upwards. Female spikes long-stalked, lax, nodding; only 1 terminal male. Utricle glabrous, grayish. (27) *C. magellanica* Lam.

Culm obtuse-angled, smooth. Female spikes short-stalked, erect. Terminal males 4. Utricle straw-purple, striolate, spinulose-margined. *C. hispida* Sch.

45. (From 38.) *Utricles very rostrate, 2-toothed.*

> Legs of rostrum directly prostrate. Leaves not septate-nodose. 46.
>
> Legs of rostrum divergent. Leaves septate-nodose. 51.

46. Culm very short, hid among leaves. Female spikes sessile, crowded. Utricle compressed. Stigmas 2. (1) *C. acaulis* d'Urv.

Culm tall (about 1 meter). Root creeping.

> Culm acute-angled, smooth. Male spikes 3; female spikes 3, distant, nutant. Utricles compressed. (32) *C. pseudocyperus* L.
>
> Culm acute-angled, rough. Male spikes 3–5; female spikes 3–5, some apically male. Utricle ovate-conical. (33) *C. riparia* Curt.

Culm unknown. Male spikes 2; female spikes 5, some apically male. Bracts very long. (35) *C. serranoi* Phil.

Culm free. Stigmas 3. 47.

47. Scales blackish. Utricles 5–7 mm., compressed. Rostrum slender, purple. Terminal spike sometimes female at apex. (5) *C. banksii* Bt.

Scales rusty. Utricles shorter, subinflated, trigonal. 48.

48. Spike long-cylindrical, dense, more or less pedunculated, often at length nodding. Utricle small. 49.

Spike oval or oblong, subsessile, erect, dense. Utricle larger. 50.

49. Leaves 2, nerved above. Utricle compressed-trigonal, olive-colored, not shining. *C. falcata* Bt.

Leaves 3–4-nerved. Utricle inflated-trigonal, brown-olive, shining, stiped. *C. lamprocarpa* Ph.

50. Scales more or less awned. Utricle greenish-yellow, purple-striolate, with 2 lateral nerves. (21) *C. inconspicua* Steud.

Scales obtusish. Utricle very and equally nervose. *C. flava brevirostrata* Kk.

51. *Rostral lobes divergent.*

(From 45.) Female spikes basilar, long-stalked, few-flowered. Utricle to 18 mm., subulate, long-rostrate. *C. macrosolen* St.
Female spikes many-flowered. Utricle shorter. 52.
52. Utricle hirtellous. 53.
Utricle glabrous. 55.
53. Utricle densely granulate, suberose. *C. tweediana* Nees.
Utricle not granulate. 54.
54. Utricle red-tomentose. Rostrum short, slightly 2-toothed. (15) *C. filiformis* L.
Utricle olive-purplish, setulose. Rostrum long, 2-toothed. *C. beechyana* Bt.
55. Utricle coriaceous, shortly and broadly rostrate; rostrum slightly 2-toothed. 56.
Utricle submembranaceously long-rostrate, and deeply 2-toothed. 59.
56. Culm short. Leaves canaliculate. Bracts sheathing. *C. pumila littorea* Labill.
Culm long. Leaves plane. 57.
57. Spike flexuose. Utricle compressed-trigonal, plumbeous, rusty-striolate. *C. brasiliensis* St. H.
Spikes erect. Utricle turgid-trigonal. 58.
58. Scales lanceolate, awned. Utricle fusiform, olive-brown, sessile. (30) *C. riparia chilensis* Brng.
Scales spatulate, bifid, very long-awned. Utricle pale, obovate-oblong, long-stalked. (39) *C. trifida* Cav.
59. Utricle globose. Rostrum long, its teeth lanceolate. *C. stenolepis* Tor.
Utricle less inflated, costate-nervose; its teeth more or less awned. 60.
60. Spikes erect. Scales black-purple, cuspidate. Utricle stramineous. *C. acutata* Bt.
Spikes ultimately pendulous. Scales whitish-rusty, awned. Utricle pale green. (32) *C. pseudocyperus platygluma* Cl. and *C. pseudocyperus hænkeana* Pr.

1. C. ACAULIS d'Urv.

Style 2-branched. *Dwarf*, 25 mm. high, with short rhizome. *Culm* enclosed in the sheaths. *Leaves* numerous, rigid, spreading, narrow-acuminate, keeled and denticulate. *Spikes* 4–5 mm. long, crowded, dense-flowered; male solitary, orbicular-ovate, 10-flowered; females 4, orbicular, 8-flowered, short-pedunculate. *Scales* yellow-rusty, pale-margined, oblong-acute, crowded. *Utricles* slightly larger, ovate-compressed; *rostrum* 2-toothed.

Falklands (the only specimen known).

(*C. æmatorhyncha* Desv. = *C. filiformis* L.)

2. C. ANDERSONI Boott.

Style 2-branched. *Stout*, 40 cm. high, the base covered by sheaths. *Spikes* 7–9, black-purple, erect, the uppermost male, the others female, oblong to cylindrical, above in twos or threes, sessile; lower ones peduncled; occasionally all are apically male. *Utricle* elliptical, short-rostrate, the mouth entire, shorter than the dark, pale-nerved *scale.*

Magellan.

3. C. APHYLLA Kunth.

Spike solitary, diœcious; *style* trifid. *Culms* cespitose, terete, rigid, glabrous, sheathed at the base, leafless. *Female* spike obliquely inserted, subtended by a spathe-like, ovate-oblong bract. *Utricles* oblong, compressed, apically narrowed, and acutely bidentate, with ciliolate angles. *Stigmas* very long. *Scales* ovate, rounded apically, convex, 3-nerved, hyaline, whitish, dorsally green, pale ferruginous at apex and margin, glabrous, deciduous. Male spike unknown.

S. Patagon., in moist hills near Rio Carren-leofú.

4. C. ATROPICTA Steud.

Style 2-branched. *Root* woody, stoloniferous. *Culm* 15–45 cm. high, smooth, leafy at base. *Leaves* plane, linear, acute, smooth or with rough edges, much shorter than the culm. *Spikes* androgynous, males at base, most of them peduncled, subternate, approximate, subovate; the *scales* oblong, obtuse, brown. *Utricles* dark-purple, apically whitish, bifid, rostellate.

(Argentina); S. Patagon. (Nordensk.); Magellan; E. and S. Fuegia (Dusén).

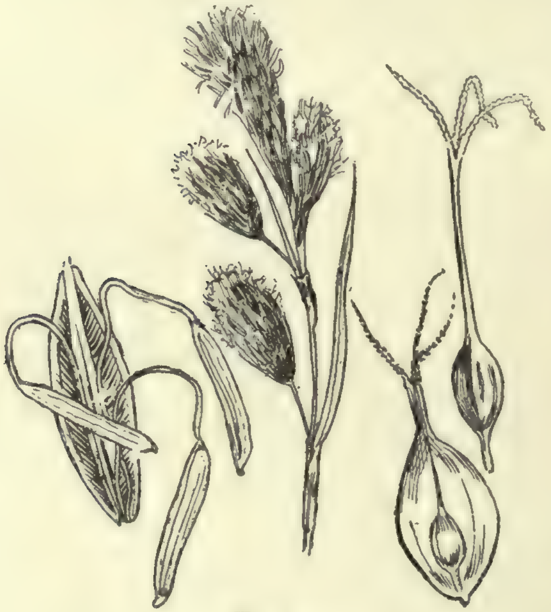


FIG. 49.

Carex banksii. Inflorescence; and (on left) male flower; (on right) female flower and achene. (From *Flora antarctica.*)

5. C. BANKSII Boott.

Style 3-branched. Culm 45 cm. tall, leafy at base, glabrous. *Leaves* 4–6 mm. broad, not as long as culm, rough on edges and nerve. *Spikes* 3–5, black-purple, oblong, basi-cuneate, thick, exsert, nodding; the uppermost one androgynous, the others female; the lowest remote. *Utricle* hyaline, whitish, compressed, broad-ovate, rostrate, its mouth oblique, bifid; shorterand broader than the dark, spatulate, emarginate, awned *scale.* (Fig. 49.)

S. Patagon., near Carren-leofú; Magellan; Fuegia.

6. C. BONARIENSIS Desf.

Style 2-branched. *Culms* cespitose. *Leaves* linear, subcarinate, rough-edged near their apex, nearly equalling the culm. *Spikes* androgynous, male at top, crowded into a spicate thyrse, 20 mm. long, with 1–2 involucrate leaves. *Bracts* within the thyrse smaller. *Utricle* spreading, broad-ovate, convex-concave, ending in a 2-toothed *rostrum.*

(Argentina); Falklands.

7. C. BRACTEOSA Kuntz.

Style 2-branched. *Culm* 12–30 cm. high, trigonal, glabrous. *Leaves* as long, plane. *Panicle* spike-like, ovate, obtuse, dense, involucrate by 2 leafly bracts. *Spikes* short, androgynous, male at apex. *Utricle* 5 mm. long, ovate, attenuate both ways, internally 4-, externally 5-nerved, spongy at base; *rostrum* smooth, rather long, 2-toothed.

(Paraguay); Chiloë; Patagonia.

8. C. CAMPYLOXYS Steud.

Style 2-cleft. Rhizome woody. *Culm* 35 cm. high, firm, smooth, leafy; *leaves* as long, upper ones bracteate. *Spikes* 4, 1 terminal, male, linear; 3 female, oblong-linear, subsessile. *Scales* oblong-linear, acuminate.

Magellan.

9. C. CANESCENS Linn.

Style bifid. *Root* fibrous, cespitose or stoloniferous. *Culm* 30 cm. high, erect, trigonal, rough. *Leaves* plane, linear, 2 mm. broad, rough-edged, acuminate, equalling the culm. *Spikes* about 6, androgynous, male at base. *Utricle* ovate, plano-convex, exceeding the broad ovate acute scales. (See *C. similis.*)

(Temperate Eurasia and N. Amer.); S. Patagon., by Rio Sta. Cruz, and Gregory Bay.

C. CANESCENS ALPICOLA Wahlenb.

Usually smaller and slender. *Spikes* smaller, acutish, in fruit subrotund and fuscescent.

(Eur.; Greenland; Alaska); Magellan; Fuegia; Falklands.

C. CANESCENS CURTA Good.

Leaves shorter than the slender, stiff *culm*. *Utricle* under 2 mm. long, beaked, equalling the scales. (Is probably *C. similis* d'Urv.)

(Eur.; N. Amer.); Magellan; Falklands.

C. CANESCENS ROBUSTA Blytt.

Magellan; E. and S. Fuegia. (Dusén.)

10. C. CAPITATA Linn.

Styles bifid. *Root* cespitose, fibrous, creeping. *Culm* 12 cm. high, slender, smooth, trigonal. *Leaves* shorter, subfiliform, rigid. *Spike* subglobose. Utricles ovate-acuminate, glabrous, compressed, longer than the round-ovate scale. *Rostrum* whitish.

11. C. DARWINII Boott.

Style 2-cleft. *Culm* stout, tall, glabrous, leafy at base. *Leaves* 6–8 mm. broad, serrate-scabrous on edge and keel. Bracts leafy, exceeding the culm. *Spikes* 8–12, ferruginous, cylindrical, peduncled, nodding; the upper 2 male; the others female, in 2's and 3's. *Utricle* elliptical, *rostrum* short, mouth entire, broader than the lanceolate-acuminate scale. (Fig. 50.)

Chonos Archip.; Patagon.; Magellan.; N. and W. Fuegia. (Dusén.)

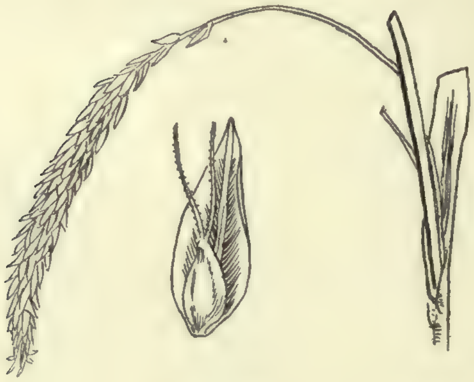


FIG. 50.

Carex darwinii, showing spike and female flower. (From *Flora antarctica*.)

12. C. DECIDUA Boott.

Style 2-cleft. *Culm* 30 cm. high. *Leaves* longer, 2–3 mm. broad, glabrous except the edges. *Spikes* 4–7, black-purple, erect; the uppermost androgynous, males at base, or also at top; the others female. Upper spikes sessile, contiguous, oblong; lower cylindrical; lowest short-peduncled, remote. *Utricle* oblong-ovate, rostellate, its mouth entire; exceeding the oblong dark scale.

(Califor.); Magellan.; Fuegia; Falklands.

C. DECIDUA MINOR Kükenth.

Patagon.; E. Fuegia. (Dusén.)

13. C. DIVISA Huds.

Styles bifid. *Rhizome* thick, creeping. *Culm* erect, obtusely triquetrous, rough upwards, 30 cm. high and more. *Leaves* narrow, of varying length, rough on edges and keel. *Spikes* crowded irregularly in an ovate head, androgynous, males at apex; an erect leafy bract at the base of the head, usually long, and acutely triquetrous. *Fruits* roundish-ovate, convex on one side, subconcave on the other. *Beak* acutely bifid with finely serrate edges. Scales ovate-elliptical, mucronate, fuscous, exceeding the utricle.

(Europe); Patagonia.

14. C. FESTIVA Dewey. (*C. inciso-dentata* Steud.)

Style 2-cleft. *Panicle* spike-like, of several androgynous, basi-masculine *spikes*, in an ovate-orbiculate head. *Utricle* ovate, acuminate, rostrate, bifid, obliquely cleft, as long as the lanceolate acute *scale*.

(N. of Eurasia and of N. Am.); Patagonia; Magellan, in damp woods; Fuegia.

15. C. FILIFORMIS Linn. (*C aëmatorhyncha* Desv.)

Stigmas 3. *Culm* slender, 60–90 cm. tall, triquetrous, scabrid above. *Leaves* narrow, with scabrid margins. *Bracts* leafy, sheathless, exceeding the culm. *Spikes* 5–6, erect, the males 2–3 above, approximate, the females 3, distant, dense, cylindric, the lowest short-peduncled. *Scales* ovate-acuminate, subulate-awned, sanguineous, 1-nerved, with the keel green. *Utricle* ovate, 4 mm. long, obsoletely nervose, rufescent, hispid, attenuate to a short obliquely truncate, ciliolate *rostrum*.

(Chili); S. Patagon., by Rio Sta. Cruz and Gregory Bay; and Carrenleofú; Fuegia.

(*C. fuscula* d'Urv. = *C. indecora* Kth.)

16. C. FUEGIANA Phil.

Styles 2-cleft. *Culm* 50–60 cm. high, slender, sometimes scabrid at top. *Leaves* half as high, strict, narrow, rough on edge and midrib. *Spikes* 3, short, contiguous, male at base and sometimes at apex, upper one larger, lower pedicelled and bracted; its bract subulate, scarcely half as long as the spike. Male scales dark-purple, the nerve white; female scales smaller, narrower than the utricle. *Utricle* compressed, its base attenuate, white, ultimately purplish; its margins yellowish, fimbriate; *rostrum* short.

E. Fuegia. (Compare *C. atropicta* Steud.)

17. C. FUSCULA d'Urv. (1825). (*C. indecora* Kth., *C. inconspicua fuscula.*)

Style 3-cleft. *Culms* triangular, glabrous. *Leaves* shorter than the culms, narrowly grass-like, plane, rigid, edge scabrid. *Male spike* solitary; *female spikes* about in 4's, little remote, cylindraceous-oblong. *Utricles* ovate-oblong, attenuate-rostrate, nerveless, rusty, glabrous, angles scabrid upwards. *Scale* round-elliptical, mucronate. *Rostrum* truncate, cleft *behind.*

Differs from *C. involucrata* Boott by bracts long, mucronate-awned, utricles green and minutely and densely fuscous-punctulate. (Speg.)

S. Patagon., by Gregory Bay and Rio Sta. Cruz; Falklands; Fuegia. N. and E. Fuegia. (Dusén.)

18. C. GAYANA Desv. (*C. divisa* Huds.)

Style 3-cleft. *Root* creeping, strongly fibrous. Culm 30–60 cm. tall, erect, trigonal, smooth, striate. *Leaves* plane, linear, acuminate, rough-edged upwards, shorter than culm. *Male spike* solitary, cylindraceous; *female spikes* 3, short-pedunculate, few-(5–10)flowered; bracts sheathing. *Utricles* ovate, obtusely trigonal, longer than the ovate-obtuse brownish scale. Rostrum short.

(Eur.; W. Asia; New Mex.; Chili.)

C. GAYANA DENSA Kükenth.

S. Patagon. (Nordensk.); N. Fuegia (Dusén).

19. C. GERMANA Boott.

Style 3-cleft. *Culm* 35 cm. high, obtuse-angled, glabrous, 2–3-leaved. *Leaves* sheathing, as long as the culm, triquetrous-acuminate, the keel and edges scabrid. *Bracts* sheathing, the upper setaceous. *Spikes* 4–6, fuscous, rusty; one or two terminal male; the others female, thick-cylindrical, dense-flowered; the upper sessile, erect; the lower stalked, nodding. *Utricles* elliptic, whitish, equalling the awned oblong scale.

W. Patagon.; Cape Tres Montes.

20. C. INCOMPTA Franchet.

Style 2-cleft. *Culm* tall, over 60 cm., slender, smooth. *Leaves* long, rather soft, margin rough, the upper not sheathing. *Bracts* exceeding the culm. *Spikes* 10–12; the upper 4–5 male or androgynous, sessile except the first; the others female, often in 2's or 3's, long-peduncled. Scales fuscous, ovate-lanceolate, as long as the utricle but narrower. *Rostrum* 2-toothed. (Fig. 51.)

Magellan, close to the sea.

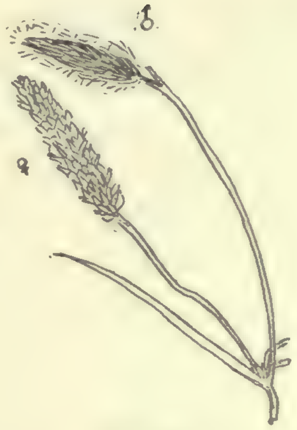


FIG. 51.
Carex incompta. Male and female spikes. (After Franchet.)

21. C. INCONSPICUA Steud.

Style 3-cleft. *Root* fibrous, yellow-rufous, cespitose. *Culm* 10–20 cm. high, erect, trigonal, smooth. *Leaves* plane, erect, as long as the culm, rough-edged. *Male spike* 1, rising from the base of the uppermost female spike; *female spikes* 3–4, oblong-ovate (12 mm. long), with longer bracts, all sessile. *Utricle* ovate, *rostrum* short, 2-cleft; scales longer, ovate, red-brown, awned. (See *C. fuscula.*)

(Chili.)

22. C. INCURVA Lightf.

Style 2-cleft. Rhizome long or creeping. *Culm* to 10 cm. high, strong, filiform-terete or compressed, trigonal upwards. *Leaves* approximate, subflexuous, narrow-linear, shorter than the culm, narrowing and keeled upwards. *Spike* capituliform, naked, aggregate of short spikes, 8–15 mm. long, ovate, basitruncate. *Scales* yellow-brown, margins hyaline, the bracteal scales mucronate. *Utricle* longer, *rostrum* acuminate, mouth cleft.

(Orient; Eur.; Greenland); E. Fuegia (Dusén).

Var. HUMILIS.

Cespitose. Falklands.

23. C. INVOLUCRATA Boott.

Style 2-cleft. *Root* cespitose, creeping. *Culm* 60 cm. tall, obtusely trigonal, sulcate, leafy at base. *Leaves* erect, half as long as the culm; 3 mm. broad, plane, acuminate, edge spinulose. *Spike* ovate, obtuse, continuous, dense, 25 mm. long, androgynous, male at the top; with two leafy reflexed bracts. *Female scales* broad, acute, keeled, mucronulate. *Utricle* longer than the scale, plano-convex, with long 2-toothed *rostrum*. Achene lenticular-oval.

(Brazil); N. Patagon.

24. C. KURTZIANA Kükenth.

Spikelets numerous, sexually mixed, apically male, subsessile, crowded in an ovate-triangular *head*. *Utricle* 3 mm. broad, membranaceous, glabrous, ovoid, winged, subversely thick, stiped. *Culm* thick and smooth.

S. Patagon.; in moist hills by Carren-leofú. Very variable.

25. C. LECHLERI Phil. (non Steud.).

Style 2-cleft. *Culm* 30 cm. high, trigonal, naked above. Leaves much shorter. *Spikes* 4, approximate, ovate, erect; the uppermost one androgynous, apically male; the others female, 7 mm. long; the lowest peduncled. *Bract* scarcely sheathing, not as long as the spike. *Scales* ovate, acute, castaneous, their midnerve green. *Utricle* compressed, obovate-oblong, spinulose-ciliate, rostrum short.

Magellan.

26. C. LEPORINA Linn. (*C. macloviana* d'Urv., *C. ovalis* Good.)

Style 2-branched. Culms 30–45 cm. tall, slender, erect, rough above. Leaves shorter, 2 mm. broad, flat. *Bracts* very short, scale-like or none. *Spikes* 4–7, oblong, male at base, 10 by 6 mm., clustered in a terminal oblong head. *Utricle* ovate-lanceolate, wing-margined; its rostrum tapering, long. *Scales* lanceolate, acute, brown, shorter than the utricles.

(Eurasia; N. Amer.; Chili); S. Patagon., by RR. Gallegos and Sta. Cruz; Falklands.

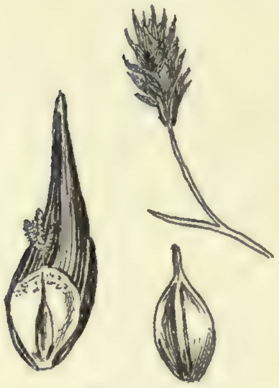


FIG. 52. *Carex magellanica.* Spike, female flower and achene. (From *Flora antarctica.*)

27. C. MAGELLANICA Lamk.

Style 3-branched. *Root* from woody fibers. *Culm* 20 cm. high, slender, filiform upwards, rough. *Spikes* 3–4, androgynous, male at their base, dark-purple, oblong, peduncled, nodding, bracteate, or the lowest sheathed. *Utricles* suborbicular, stipitate, mouth of rostrum entire; half as long as the long scale. (Fig. 52.)

(Iceland; Arctic regions; W. Amer.; Chili); S. Patagon., near Carrenleofú; Magell.; S. Fuegia.

(*C. microglochin* sub *Uncinia.*)

28. C. ORTEGÆ Phil.

Culm 22 cm. high, smooth, not cespitose. *Leaves* scarcely half as long, filiform, smooth. *Bract* terminal, 6 times as long as the apparently lateral spike; *spike* subglobose, male above, female below. *Female* scales ovate, castaneous, with a long leafy cusp. *Utricles* oblong, narrowing both ways; rostrum bifid, with erect teeth. *Achene* orbicular, compressed, black.

Fuegia (along with *C. fuegiana*).

29. C. PATAGONICA Speg. (Plate XII.)

Androgynous, acrandrous, monostachyous, 3-styled, glabrous, densely cespitose. *Leaves* fasciculate, long, and finely filiform, erect. *Spikes* few-flowered, concealed amid the bases of the leaves, bracteolate, subglobose, pseudolateral, the bracts ovate-triangular, acute. *Utricle* finely obovate, glabrous, 3 by 1 mm., with 3 divaricate stigmas. *Achenes* obovate, smooth, dorsally convex, ventrally plane, rufescent, sometimes trigonous, depending on immaturity. *Culms* from the center of the leaf-fascicles, but scarcely rising above the leaf-sheaths, 5–15 mm. high by 0.3 mm. thick, glabrous. Leaves and bracts narrow-linear, green, acute, dorsally nervose, produced straight.

Patagon., in drains by Rio Chubut (Speg.); by Rio Sta. Cruz (Hatcher.)

30. C. PEDICELLATA Phil.

Style 2-branched. *Culm* 20 cm. high, sheathed at base by dead leaves. *Leaves* as long, flat, smooth, 4 mm. broad, the penultimate culm-leaf much exceeding the crowded, erect short *spikes*. Uppermost spike male, three lower female. *Scales* oblong, obtuse, mid yellow, margin dark. *Utricle* green, white at base, stalked, inflated.

W. Patagon.; Valley of Rio Pequena.

31. C. PROPINQUA Nees & Mey.

Style 2-cleft. *Root* creeping. *Leaves* shorter than the culm, recurved, trigonal, acuminate, scabrid. Compound *spike* short, ovate, dense, having 5–6 ovate spikes, which are male at the base. *Utricles* plano-convex, ovate, with sharp denticulate angles. *Scales* shorter, ovate-oblong; *rostrum* acute, 2-toothed.

(Equat. Andes; Chili; Argent.); Patagon., Rio Sta. Cruz; Magellan; S. Fuegia.

32. C. PSEUDOCYPERUS Linn.

Tristylous. Terminal *male spike* solitary, and 3–6 dense cylindrical *female* spikes drooping on long pedicels. *Culms* 60–90 cm. high, acute-angled, glabrous, rough on the angles, at least above. Leaves nodulose, 5–10 mm. broad. *Bracts* leafy; the lowermost sometimes sheathing the others without sheaths. *Scales* setaceous, scabrous.

Fruit oblong, very acuminate, ribbed. *Rostrum* bifid.

(Old World.) Patagonia; common in swamps near Rio Chubut; by Lago Nahuel-huapi.

33. C. RIPARIA Curtis.

Style 3-cleft. *Root* thick, creeping. *Culm* about 1 meter tall, acutely trigonal, rough-edged. *Leaves* plane, broad, rough-edged, acuminate. *Bracts* leafy, exceeding the culm, their sheaths short. *Male* spikes 3–5, at top; about as many *female spikes* below, cylindrical, sometimes male apically. *Utricle* ovate, tapering to a short 2-toothed *rostrum*. *Scale* shorter, ovate-oblong, awned.

(Eur. and N. Am. Brit. & Br. i, 303); "common along water courses in N. Patagon. to Buenos Ayres" (J. Ball). The form *incrassata*, has very long leaves, male spikes, a large terminal surrounded by small ones; the scale having 7 confluent whitish nerves with interposed furrows on the lower surface.

C. RIPARIA CHILENSIS Brongn.

Leaves very long, linear. *Male spike* solitary; *female spikes* ovate-oblong. *Scales* lanceolate-subulate, longer than their utricles.

N. Patagon., mouth of Rio Chubut. (Dusén.)

34. C. SCHEDONAUTOS Steud.

Style 2-cleft. *Culm* to 60 cm. tall, erect, trigonal, glabrous, with loose leafless sheaths below, leafy above. Culm *leaves* plane, narrow-lanceolate, rough-edged, with setaceous apex; sometimes exceeding the culm. *Spike-like* crowd of alternate glomerules, 25 mm. long; male and androgynous intermingled. *Scales* ovate, with excurrent midnerve, the lower broad-lacerous, longer than the short glabrous *utricle* with 2-cleft rostrum. *Achene* trigonal, smooth.

Magellan, Oazy Bay.

35. C. SERRANOI Phil.

Styles 3. Culm? Leaves? *Bracts* very long, not sheathing, the lowest 5 mm. broad. *Spikes* approximate, all but the lowest erect; 2 male, 5 female, the upper ones male at their apex. *Male* scales lanceolate, their center white; *female* scales longer and twice as broad. *Utricles* firm, ovate-elliptical, acute both ways, compressed, margined, ventrally flat and 2-nerved, dorsally 5-nerved, convex. *Achene* red, ovate, acute, compressed.

High up in W. Patagon. at 700 meters, partly snow-covered.

36. C. SIMILIS d'Urv. (1825). (*C. curta* Good.)

Culm triquetrous, strict, slightly scabrous. *Leaves* plane, linear, subcarinate, apex subulate. *Spikes* 6–rarely 8, androgynous, the lower part male, sessile, alternate, elliptical; upper ones approximate. *Scales* ovate, acutish, squarrose, with 1 green nerve. *Fruits* ovate-lanceolate, scarcely bidentate. Perennial. "Is decidedly the European *C. curta*" (Stendel); a synonym of *C. canescens* L. (Index Kewensis).

Fuegia, Basket Isle, Amakouáia, rare; Falklands.

37. C. SUBANTARCTICA Speg.

Diœcious, distylous. *Culms* low, angulate-terete, very sulcate, smooth; leaves as long or shorter, slightly coriaceous, very carinate, rather flat, glaucescent-green, narrowing upwards to a blunt triquetrous point. Cylindraceous-fusoid *male spike* solitary, acrogenous, bractless, its scales spatulate, obtuse, the lower subretuse, the upper rounded, often mucronate, with a hyaline margin, subcarinately green. Stamens long-exsert. *Female spikes* few; the primary one exsert, acrogenous on the culm, the secondaries smaller at base of the culm, and almost concealed in the leaves; their scales more acute and pale than in the males; *utricles subelliptical*, subsessile, dorsally convex-concave, scarcely nervose, glabrous, abruptly ending in a long truncate toothless rostrum. *Achene* plumbeous, punctulate, lenticular.

S. Patagon., in hills along Carren-leofú, and by Rio Sta. Cruz.

Rhizome deep, often sending up numerous branches; each culm bearing about 20 leaves, about 3–9 cm. long.

38. C. TRICHODES Steud.

Stigmas 2, exsert. *Culms* many, erect, 10–15 cm. high, capillary-setaceous, compressed-triangular, few-leaved above the base. *Leaves* flexuose, setaceous, slightly longer than the culm, obtuse, serrulate. *Spikes* ellipsoid, 4 by 3 mm., becoming subglobular, few-flowered. *Scales* 3-nerved, keel green, sides brown; the upper acuminate-mucronate, the 3–2 lowest leafy, cusped. *Utricles* exceeding the scale, compressed, biconvex, their rostrum scabrid, their mouth 2-toothed.

(Chili); S. Fuegia, about Ushuaia.

39. C. TRIFIDA Cav.

Style 3-cleft. *Culm* 60–90 cm. tall, robust, trigonal, erect, its apex smooth. *Spikes* 6–8, erect, approximate, cylindric-ventricose; the 3 uppermost male, sessile; the others female; the lowest stalked. The lowest *bract* leafy, scabrid, exceeding the culm. *Scales* linear, brown-rusty, their keel white, 3-nerved, irregularly emarginate. *Utricles* obovate, abruptly terminated by a cylindrical 2-cusped *rostrum*, with a white *awn*; attenuate at base.

(New Zeal.; Antipodes; Auckland and Chatham Is.); Magellan. Cape Tres Montes; Falklands; Fuegia (Hariot).

"A noble species, growing with and emulating the young tussock-grass." That found in Fuegia has the awn on the scale short, and the scale itself not bilobed.

C. TRIFIDA FRANCHETII Kurtz.

Differs from the typical species by having the *spikes* once or twice smaller, the *awns* much smaller; the *utricle* membranaceous, whitish, more or less purple-marked; uppermost spike often apically female.

Fuegia, subalpine by Rio Grande on Beagle Channel.

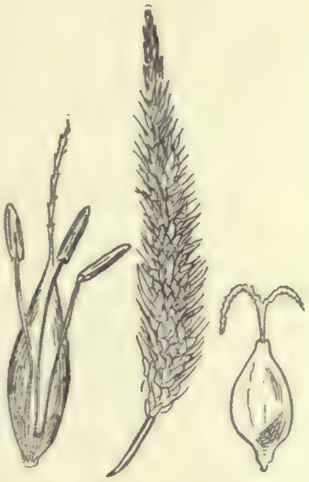
40. C. UROLEPIS Franchet.

Style 2-cleft. *Culm* a meter or more high, robust, trigonal, two sides concave, the angles scabrid. *Leaves* very long, to 10 mm. broad, rough-edged, upper ones auricled but not sheathing. *Spikes* 10–15, the 2–4 uppermost male; the lower androgynous or female except their apex; often with pairs pendulous; the lower peduncled. *Scales* fuscous, white dorsally, ovate-lanceolate, their point recurved, scabrid. *Utricles* ovate, 3–5-nerved; *rostrum* conspicuous, 2-toothed. Lowest spike 8–9 cm. long, becoming 1 cm. thick. (Fig. 53.)

(Near *C. darwinii* Boott, but more robust and rigid. Points of the scales much prolonged, and utricles proportionately longer.)

S. Patagon., Otway L., Puerto Bono, Port Eden.

FIG. 53.



Carex urolepis. Spike, male flower, and utricle. (After Franchet.)

41. C. VULGARIS Fries.

Digynous. Terminal *spikelets*, 1–2, male; the others, 3–4, female. *Rostrum* toothless. *Leaves* slender, their sheaths not filamentous. *Culm* erect, trigonal, obtuse-angled, 30 cm. or more high. Lower *spike* shortly stalked; lower bract leafy, with short, round, dark auricles. *Scales* elliptic to ovate-obtuse.

Utricle plano-convex, elliptic, or obtuse, with filiform nerves upwards. *Rostrum* toothless.

(Old World); Patagon., in watery places by Rio Chubut and Carrenleofú.

Family 12. ARACEÆ.

Mostly herbs, with simple or compound usually basal *leaves*, often veiny, and monœcious, or sometimes diœcious or hermaphrodite *flowers* on a simple *spadix*, usually surrounded by a *spathe*, and usually *without perianth*. *Fruit* often a berry, with erect, orthotropous *embryo*.

Species 900, most tropical; some in temperate regions, (in Australia, not reported from New Zeal.).

PISTIA Linn.

Floating, stemless, pubescent, stoloniferous, with fibrous roots. *Leaves* rosulate, sessile, obovate-cuneate, with fan-like nerves. *Spathe* small, white, plicate on both sides, half embracing the base of the ovary, with an open cucullate limb. *Spadix* not appendaged, with a solitary apical, 2-staminate *male flower* and a solitary *female flower* at its base, dorsally adnate to the spathe.

Only species:

P. stratiotes Linn.

In tropical fresh-water ponds and streams. From Texas by W. Indies and Central Amer. to Argentina and Patagonia. (Not in Australia or the Pacific Is.)

(Fig. in Eng. & Prantl, ii, 3, p. 153.)

Family 13. Lemnaceæ. Duckweed.

Minute floating plants without differentiation of leaf and stem, consisting, in the active stage, of a loosely cellular *frond*, with or without roots, and extending by lateral branching, the new fronds soon separating. Reproduction by minute *unisexual flowers* immersed, mostly with a delicate *spathe* in the brood-pouch. *Male flowers* 1–2, having 1 stamen; *female flower* 1, with 1 carpel and 1–few seeds, having endosperm.

Species 28, widely distributed.

A. Frond with roots and 2 reproductive pouches.
  b. Roots usually more than 1, fascicled. Anthers dehiscing longitudinally. *Spirodela.*
  b2. Root solitary. Anthers dehiscing transversely. *Lemna.*
A2. Frond rootless and nerveless, with 1 reproductive pouch.
  b. Frond thick, subglobular. *Wolffia.*
  b2. Frond thin, elongated. *Wolffiella.*

1. SPIRODELA Schleiden.

Stipe fixed peltately under the frond; *roots* more than 1. Reproductive pouches 2, as cleft openings at base of the frond; *spathes* sac-like. *Anthers* 2-celled, with longitudinal dehiscence. Ovules 2, rarely 1.

S. punctata (Meyer sub *Lemna*) Thompson.

Frond solitary to 2–4, cohering in a chain, elliptical to reniform, averaging 2.5 by 1.4 mm., obscurely 3-nerved, convex above, punctate with brown pigment-cells. *Spathes* with flowers protruding; 2 staminate and 1 pistillate flowers on the spadix. *Filaments* long; *fruits* short, broad, with wings. Seed 1.

Orange Harbor, near Cape Horn, collected by the Wilkes Exploring Expedition, 1839, and forwarded by the courtesy of Professor B. L. Robinson, of the Gray Herbarium, for identification by Professor C. H. Thompson, Missouri Botanic Garden. (See also Thompson in Report of Missouri Bot. Gard. 1897.) It occurs also in British Guiana.

2. LEMNA Linn. Duckweed.

Frond disk-shaped, with a central nerve, and sometimes also with 2–4 lateral nerves; with one rootlet usually ending in a blunt rootcap. *Fruit* ovoid, ribbed.

Species 7, in temp. and trop. regions. (Fig. in Brit. & Br. i, 366.) Hatcher informs us that "Duckweed is abundant in the waters" of S. Patagonia.

1. L. GIBBA Linn.

Frond unsymmetrical, minute, thickish or gibbous underneath, 3–5-nerved. *Ovules* 2–6, anatropous; *seeds* deeply and unequally ribbed.

Cosmopolitan; in quiet waters of Chili; probably also in Patagon.

2. L. MINOR Linn.

Frond thickish, obovate or orbicular, sometimes purplish, with 3–5 lateral nerves. *Ovule* 1, orthotropous; *seed* 12–15-ribbed.

Distribution as the preceding; in pools near Rio Chubut.

3. L. VALDIVIANA Phil.

Frond oblong-elliptical, thin, short-stalked, nerveless. *Seed* 20-ribbed.
(N. and S. Amer., Chili); Argentina.

3. WOLFFIELLA Hegelmaier.

(C. H. Thompson in Missouri Bot. Gard., 9th Annual Report, 1897.)

Wolffia and *Wolffiella* agree in being rootless, nerveless, leafless, with a terminal reproductive pouch, from which arise sessile branches which soon become separate fronds. The *fronds* of *Wolffia* proper are subglobular; those of *Wolffiella* are elongated, very thin and punctate, with brown pigment-cells. *Flowers* and *fruit* of *Wolffiella* are unknown.

Species 4, warm parts of Amer.

W. GLADIATA Hglm.

Frond about 6 times as long as broad, widest at the deeply excavated reproductive pouch. (Fig. in Eng. & Prantl, ii, 3, p. 154, *K.*)

(Mexico; Argentina); probably in N. Patagon.

Family 14. RESTIONACEÆ.

Perennial, cespitose or rhizomatous herbs with cyperaceous or reduced *herbage* and mostly diœcious *flowers* in *spikelets* like Cyperaceæ, but with juncaceous perianth. *Female spikelets* occasionally having only 1 flower. *Stamens* mostly 3, and represented by staminodes in the female flowers. *Anthers* often 1-celled. *Ovary* 1–3-celled; cells 1-seeded; *seeds* orthotropous, with small *embryo* and large endosperm.

Species 230, most in S. W. Africa and Austral.; few in N. Zeal.; fewer in the Orient; and 1 in Chili, etc.

LEPTOCARPUS R. Br. (*Schœnodon* Labill. p. p.)

Rhizome creeping. *Leaf-sheaths* not deciduous. *Diœcious* (rarely monœcious), 3-merous, rarely 2-merous. *Ovary* 1-celled, 1-seeded. *Fruit* dehiscing on the angles, or indehiscent. *Spikelets* many-flowered; the female rarely 1-flowered. *Scales* imbricating.

Species 21, in S. Afr. and Austr. and stragglers in the Orient, N. Zeal. and S. Amer.

L. CHILENSIS Gay (Steud. sub *Calopsis*).

Root fibrous, cespitiferous, subsarmentose. *Culms* erect, strict, simple, nearly 1 meter high, glabrous; the sheaths leafless, in pairs mutually embracing, obtuse, mucronulate, at length cleft, fuscescent. Apical *spikes* numerous, the lower remote, smaller or none; *spikelets* bracteolate. *Bracts* oblong-ovate, mostly bifid, somewhat rusty. *Sepals* of female flowers narrow, the outer obovate, mucronate. *Stigmas* 3; *ovary* triquetrous.

(Chili); W. Patagon.

Family 15. CENTROLEPIDACEÆ.

Small moss-like or grass-like herbs, with perfect or polygamous sessile, hypogynous *flowers* in glumaceous spikelets; without *perianth; stamens* 1–2, with 1 versatile anther. *Ovary* 1–3-locular, each locule with 1 pendulous orthotropous *ovule. Seeds* with subfarinaceous endosperm.

Species 30, in southern Australia; with stragglers in the Orient, Tasmania, N. Zeal., Auckland I., and Antarctic America.

GAIMARDIA Gaudich.

Moss-like perennials, with 2-merous *flowers*, in 2-flowered *spikelets*, on a terminal peduncle. *Leaves* imbricate, distichous on branching stems.

G. AUSTRALIS Gaud. (Figs. *G–J* in Eng. & Prantl, ii, 4, p. 12.)

Leaves subulate-triquetrous, sheathing at base.

Falklands; Fuegia. W. Magellan, forming peat. (*G. setacea* Hook. f. in New Zeal.)

G. PUSILLA Gaud.

Small, moss-like. *Stem* erect, subfastigiate, branching above, densely leafy. *Leaves* imbricate, subulate-triquetrous, sheathing at base. *Branches* sparse, leafy, ending in a solitary, 1-flowered *spikelet*.

Fuegia; turf-mosses, especially on the mountains.

Family 16. BROMELIACEÆ. Pine-apple.

Epiphytic herbs (or some tropical, terrestrial plants), with mostly scurfy, narrow, sheathing *leaves*, trimerous, regular flowers with double *perianths*, the inner petaloid, and 6 stamens. *Ovary* inferior or superior, 3-locular; *style* 1; *stigmas* 3. *Seeds* numerous.

Species 900, in warm countries.

1. TILLANDSIA Linn. Hanging-moss.

Epiphytes with narrow, entire *leaves*, perianth-leaves free or nearly so; *stamens*, all or three of them hypogynous. *Capsule* septicidal.

Species 350, American.

1. T. ANDICOLA Gill.

Leafy *stem* to 7 cm. long, flexuous, with about 20 sheathing, distichous *leaves*, which are coriaceous, subterete from a lanceolate, clasping base; 2–5 cm. by 1.5 mm.; leaves and 1-flowered peduncles covered by fine scales. *Sepals* naked, lanceolate, ribbed.

(Andes of Mendoza.) May be in N. Patagon.

2. T. COARCTATA (Gill.) Mez. (*T. bryoides* Gris. p. p.)

Dwarf, like club-moss; stem 5–7 cm. long, cespitose, densely leafy. *Leaves* 8–12 mm., short, flexuose, erect, imbricate, linear-acuminate, scurfy. *Peduncle* 1-flowered. *Stamens* deeply included within the minute petals, the *flower* partly concealed by the uppermost leaves, supported by a 1-nerved bractlet. *Bracts* lanceolate, shorter than the sepals. *Sepals* united at base. Limb of *petals* minute, shortly exceeding the calyx. *Capsule* 3 times as long.

(Argentina); epiphytic or on rocks.

T. COARCTATA PEDICELLATA.

Scape more or less manifest, tall and naked.

(Solinia; Argentina); N. Patagonia.

T. MYOSURA Gris.

Stems thickish, divided from a woody base, leafy; to 15 cm. tall. *Leaves* with dilated sheaths, rather remote, distichous, linear, attenuate, canaliculate-convolute, acuminate, tip recurved, scaly above the middle. *Peduncles* axillary or terminal, as long as the stems, exsert. Inflorescence 1–5-flowered, distichous. *Bractlets* longer than the 3-leaved calyx, exceeding the internodes, *sepals* not united, *petal-claws* as long as the calyx; lamina deltoid, violet when dry, one fourth as long. *Stamens* deeply included, slightly exceeding the style.

(Bolivia, near Mendoza); at Lago Narraco, Patagonia.

3. T. RETORTA Gris. (*T. nappii darwinii* L. & N.)

Stems short, densely cespitose, leafy, branching above, 7 cm. tall. *Leaves* with dilated sheath, rather remote, distichous, linear-acuminate, convolute, recurved and apex incurved, lepidote-scaly. *Peduncles* naked, axillary, equalling the leaf, 1-flowered, rarely 2-flowered. *Calyx* 3-leaved, nearly as long as the bracteole, 2–3 times shorter than the capsule. *Petals* minute; *stamens* deeply included, slightly exceeding the style.

(Argentina; Bolivia); N. Patagon.

(Mez. resolves *T. bryoides* Gris. into 2 species, one *T. coarctata* Gill., the other *T. polytrichoides* Mez. found in Brazil and Argentina.)

2. FASCICULARIA Mez.

Flowers hermaphrodite. *Sepals* free, carinate, lepidote-tomentose. *Petals* free to the base, at anthesis slightly patent only at the tips, otherwise erect, fleshy, apically rounded, and with 2 small ligules inside near the base. *Stamens* free; anthers long; pollen-grains globular, not sulcate. *Ovary* inferior, with manifest epigynous tube. *Stigmas* leafy. *Fruit* an indehiscent berry. *Ovules* few, globose. Terrestrial stemless herbs, having the leaves armed with marginal spines.

F. LITORALIS Mez. (Phil. sub *Rhodostachys*).

Leaves glabrate above, with small dense appressed pallid scales underneath. *Inflorescence* rather many-flowered, terminal. *Bracts* broadly elliptical, acute, exceeding the flowers. *Sepals* oblong-lanceolate, the apex acuminate-mucronate.

(Chili); W. Patagon. (?)

Family 17. JUNCACEÆ. Rush Family.

Usually tufted grass-like herbs, or with subulate *leaves;* with small, regular *flowers*, often panicled; *perianth* 6-parted, its tepals dry, persistent; *stamens* 3 or 6, rarely 4 or 5; *ovary* superior, 3-carpellary, 1- or 3-locular; style 1. *Fruit* capsular; *seeds* 3 or more, rarely only 1.

Species 200, cosmopolitan, mostly in moist places.

KEY TO THE GENERA.

A. Flowers solitary, terminal, rather large.
  b. Leaf subtending flowers small, bract-like. Flowers 2–4 cm. long. Seeds scobiform. 1. *Marsippospermum*, p. 295.
  b2. Leaf subtending the flowers exceeding them; upper bracts equalling the flowers. Seeds obovate. 2. *Rostkovia*, p. 296.
A2. Flowers numerous, usually small. Perianth glumaceous.
  b. Leaf-sheaths open. Capsules many-seeded. 3. *Juncus*, p. 296.
  2b. Leaf-sheaths closed. Capsule 3-seeded. 4. *Juncoides* (*Luzula*), p. 301.

(*Distichia*, with diœcious flowers and closely imbricating 2-ranked leaves, is in the Bolivian Andes, reaching to the snow-line.)

1. MARSIPPOSPERMUM Desv.

Rush-like; *culm* 3 cm. long, terminally 1-flowered, surrounded by basal *leaves*, of which 1–2 are cylindric with short spout-like blade, the others are like barren culms. *Perianth-leaves* linear, the inner smaller. *Fruit* ovoid, 3-locular, parchment-like. *Seeds* with fine testa, appendaged at base.

Species 2 (*M. gracile* Buch. in N. Zeal.).

M. GRANDIFLORUM (Hook. f. sub *Rostkovia*).

Creeping. *Culm* rigid, terete, naked; *leaves* similar, but thicker and longer. *Flower* solitary, large, 3-bracted. *Perianth-leaves* linear, acute-subulate, slightly pungent, unequal; *anthers* long, 2-cusped, filaments short.

W. Patagon.; Magellan; Fuegia to Cape Horn; Falklands. Common in woody regions and swamps, to 400 m. high (Dusén); used for weaving into baskets (J. D. Hook.).

2. ROSTKOVIA Desv.

Rush-like, having a naked culm, often sheathed, and with one linear or terete *leaf*. *Flower* solitary, terminal, its perianth-leaves distinct. *Ovary* 1-locular; capsule globular-oblong, many-seeded.

Only 1 species, viz.:

R. SPHÆROCARPA Desv. (*R. magellanica* Hook. f.).

Rootstock not creeping. *Culm* 15–30 cm. high, compressed. Radical *leaves* plane, glabrous, sheathing and exceeding the culm. *Perianth-leaves* subequal, linear, acute, scarious-margined, as long as the capsule. Flower subtended by a long bract. (Fig. 6 in Eng. & Prantl, ii, 5, p. 6).

S. Patagon., Cordilleras (J. B. Hatcher; in fruit Feb. 15, 1897) in the rainy wood-region (Dusén); Fuegia to Cape Horn and Campbell's I. Rare in the steppes.

R. SPHÆROCARPA PUMILA Alboff. (sub v. *R. magellanica pumila*).

Small, 5–7 cm. high. Leaves longer. Perianth-leaves shorter, less acute. Style long.

Alpine, by Rio Grande near Ushuaia.

3. JUNCUS Linn. Rush.

Chiefly glabrous perennials, with scape-like culms, leaf-sheaths open at one side, leaf-blades terete or grass-like. Flowers variously panicled, often 1-sided. Seeds several, sometimes with tails.

Species 150, most in N. Temperate zone.

KEY TO THE SPECIES.

A. Lowest leaf of the inflorescence terete, like a continuation of the stem, with a seemingly lateral inflorescence.

  b. Flowers bracteolate, inserted singly. Stamens 6.

c. Tepals green, acute, as long as the capsule. *filiformis.*

c2. Tepals with 2 chestnut stripes. *balticus.*

c3. Tepals brown-margined. *leseurii.*

b2. Flowers non-braceolate, inserted in heads on branches of the inflorescence. Tepals green. *maritimus.*

A2. Lowest leaf of inflorescence not continuing the stem. Inflorescence seeming terminal.

b. Leaf-blade flat or terete, not septate internally.

c. Flowers bracteolate, not in heads.

d. Inflorescence terminal, flowers remote, unilateral. *bufonius.*

d2. Flowers solitary in the axils, stamens 5–6. *depauperatus.*

d3. Inflorescence decompound; stamens 6. *graminifolius.*

c2. Flowers in heads, not bracteolate; fruit 1-celled.

d. Stamens 6. *dombeyanus.*

d2. Stamens 3. *planifolius.*

b2. Leaf-blades terete or flat, internally septate, not channeled above base. Tepals equal.

c. Erect, 20 cm. Cyme with 1-leaved involucre, with sessile glomerules. *microcephalus.*

c2. Low, 40 mm. Spikes in pairs. Leaves filiform. *scheuchzerioides.*

b3. Leaf-blade subulate, internally septate, channeled half way. *stipularis.*

A3. Leaf-blade semiterete, sulcate, rigid. Inflorescence depauperate, terminal; bract thrice longer. *chamissonis.*

A4. Leaves flat. Culm erect, compressed. Panicle lax. Annual. Tepals equal. *cyperoides.*

A5. Sheaths leafless. Culm compressed. Cyme lateral, diffuse. Tepals narrow, the outer longer. *mexicanus.*

A6. Tall, 60 cm. Cyme with outer rays long. Tepals ovate, inner obtuse, outer acute. Leafless. *procerus.*

1. J. ACUTUS Linn. Great Sharp Sea-rush.

Barren *culms* and outer *bracts* pungent. *Panicle* very compound, dense; clusters 2–4-flowered. *Perianth-leaves* half as long as the large, broad-ovate, acuminate, glossy-brown capsule; inner 3 with a broad membranous border at the apex.

(Eur., Brazil); Patagon., in salines near Carmen de Patagones.

Panicle more contracted than in the type.

2. J. BALTICUS Linn.

Rhizome creeping. *Culm* 30–60 cm., stiff, often prickly at top, obscurely striate. Pith continuous. *Panicle* erect, branched. *Tepals* subequal, ovate-lanceolate, very acute, as long as the elliptical, scarcely trigonous, obtuse, mucronate capsule. *Stamens* 6.

(Eurasia and Amer., chiefly near the sea); (Argentina); Patagon., along Rio Sta. Cruz, and Rio Chubut.

3. J. BUFONIUS Linn.

Annual, with fibrous cespitiferous roots. *Culms* 7–25 cm., diffuse, mostly simple, leafy. *Leaves* plane, subsetaceous, channeled. *Inflorescence* terminal, of 3–4 long, unequal, simple or bifid rays; *flowers* remote, solitary, unilateral; the upper fasciculate. *Tepals* narrow, acuminate, exceeding the oblong *capsule.*

(Old and New Worlds; Tasmania; Australia); Patagon., by Rio Sta. Cruz.

J. BUFONIUS VIRIDESCENS Buch.

Tepals longer.

At Rawson, Patagon.

4. J. CHAMISSONIS Kunth.

Culms cespitose, erect, rigid, sulcate-striate, leafy towards base. *Leaves* semi-terete, dorsally sulcate-striate, internally slightly canaliculate, rigid, shorter than the culm. *Inflorescence* terminal, depauperate, biradiate, with a floral leaf thrice longer. *Flowers* about 4 in the ray, unilateral, 6-staminate. *Tepals* ovate-oblong, acute, the inner slightly shorter. *Capsule* ovate-oblong, obtuse, muticous, triangular upwards; just exceeding the tepals.

(Chili); N. Patagon., not rare in meadows near Carmen de Patagones.

5. J. CYPEROIDES Laharp.

Culm erect, 10–12 cm., compressed, with 3–6 nodes. *Leaves* plane, flaccid, subnervose, on culms, 3–5. *Panicle* erect, compound, rather lax. *Spikes* 6–10-flowered. *Tepals* equal, linear-lanceolate, acute, shorter than the subpyramidal triquetrous capsule. Annual.

(S. Amer.); Chubut, common in hills near Carren-leofú.

6. J. DEPAUPERATUS Phil. (*J. mandoni* Buch.)

Densely cespitose. *Culm* 3–4 cm., low, stoloniferous, procumbent, apex erect. *Leaves* alternate, sheathing, the sheaths with ovate-obtuse auricles; blades 20 mm. long, channeled on upper face, hollow, not septate. *Flowers* solitary in the axils, naked, bractless; petiole 6 mm. *Tepals* 3-nerved, margins thin; inner broader than outer. Stamens 5–6, shorter than tepals. *Ovary* orbicular-trigonal, 1-locular, many-seeded.

(Bolivia, per Gray Herbarium; Chili); S. Patagon., Coy Inlet (Hatcher); E. Fuegia (Dusén).

7. J. DOMBEYANUS J. Gay. (*J. pallescens* Lam. p. p.)

Stout; 45 cm. high. *Culm* and *leaves* compressed-terete, nodulose. *Panicle* compound, rather dense; heads many, 8–10-flowered, globose; *flowers* large, *tepals* castaneous, lanceolate, acute, exceeding the oblong, mucronulate, black, shining *capsule; stamens* 6.

(Peru); S. Patagon.

8. J. FILIFORMIS Linn.

Culm slender, filiform, valleculate. *Sheaths* radical, leafless. *Inflorescence* scarcely compound, 5–7-flowered. Lower *bract* basilar. Upper generally mucroniferous. *Fruit* spherical-ovate, obtuse, 3-septate. *Seeds* tailless.

(Arctic-alpine of Eurasia-America, N. Zeal.) Patagonia, by R. Sta. Cruz.

9. J. GRAMINIFOLIUS E. Mey.

Small, glaucous with branching, leafy *culm*. *Leaves* striate, nerveless, the upper exceeding the decompound inflorescence. *Tepals* equal, lance-acuminate, shorter than the trigonal-elliptical, mucronate, 1-locular *capsule*. *Stamens* 6.

(Chili); Chonos Archipel.

10. J. LESEURII Bol.

Rootstock matted. *Stems* leafless and scape-like, sheathed at base. *Panicles* sessile, seemingly lateral, large; scape soft or hollow; spathe exceeding the panicle. *Flowers* somewhat secund. *Tepals* 5–6 mm., lanceolate-acuminate, brown-margined. *Stamens* 6, anthers exceeding the filaments. *Capsule* brown, oblong-ovate, acute, not beaked, nor exceeding the tepals. *Seeds* rather smooth, ovate, obtuse.

(California); W. Patagon.; in marshes by Carren-leofú.

11. J. MARITIMUS Lam. Lesser Sharp Sea-rush.

Culms naked with basal sheaths. *Leaves* terete, not septate, 45–60 cm., shorter than the culms. *Thyrse* decompound, erect, with many flowers in the dichotomies of the rays. *Tepals* equal, lanceolate, acute, as long as the elliptical, mucronate *capsule*. *Stamens* 6. *Testa* of seed sacculate at both ends.

(Cosmopol., Fig. in Brit. & Br. i, 384); Patagon. (Hatcher), the tepals acuminate, not mucronate, and castaneous in the center.

12. J. MEXICANUS Willd. (*J. compressus* H. B. & K.)

Root creeping, compressed. *Culms* cespitose, 4–5 cm., striate, glabrous, erect, compressed. *Sheaths* leafless, acute, pallid-fuscescent. *Cyme* lateral, branching diffuse. *Tepals* lanceolate, acutely subulate, outer ones slightly longer. *Style* long. *Capsule* triquetrous-oblong, acutish, equalling the sepals.

(S. Amer., Mexico); S. Patagon., in Isle Pavon, Rio Sta. Cruz, and Rio Chico near Chonkenk-aike.

13. J. MICROCEPHALUS H. B. & K.

Creeping cespitiferous root. *Culm* terete, erect, 20–25 cm., leafy. *Leaves* terete, articulate, glabrous. Inflorescence terminal, cymose, with a 1-leaved involucre, resembling the leaves but much shorter. *Flowers* capitately crowded in sessile glomerules. *Tepals* acuminate-cuspidate, subequal, exceeding the outer trigonal obtuse capsule. Varies in height of culm and size of inflorescence.

(S. Amer.); N. Patagon., common in wet places near Carmen de Patagones.

14. J. PLANIFOLIUS Brown.

Cespitose. *Culm* 25–45 cm. high, leafless. *Leaves* numerous, flat, grass-like, 2–7 mm. broad, shorter than the culm, with long imbricating 2-ranked sheaths. *Thyrse* terminal; bracts small, or 1–2 leafy. Globular clusters of brown flowers at base and ends of the branches. *Tepals* 2 mm. long, acute. *Stamens* 3. *Capsule* mucronate, equalling the tepals. *Seeds* numerous, ovoid, small.

(New Zeal.; Austral.; Chili); N. Patagon.

J. PLANIFOLIUS DEMISSUS Steud.

Culm leafy below, naked above, 10–15 cm. high, 1–several-headed. *Leaves* herbaceous, plane, lanceolate, shorter than the culm. *Sepals* subequal, the outer acute, the inner obtuse. *Stamens* 6. *Seeds* ovate, minute.

Valdivia; W. Patagon.

15. J. PROCERUS E. Mey.

Leafless (?). *Scape* smooth, soft (exceeding 60 cm.), finely striate, with dense pith. *Inflorescence* subdecompound, subcymose, the lower rays very long. *Tepals* ovate, outer ones acute, inner ones slightly shorter, obtuse, mucronulate, scarcely exceeding the triquetrous-ovate, obtuse *capsule.*

(Chili); Chubut, in wet mountain places near Rio Carren-leofú.

16. J. SCHEUCHZERIOIDES Gaudich.

Rhizome jointed, long, rufescent. *Culm* low (25–50 mm.), basally clothed with sheaths and leaves. *Leaves* filiform, jointed, exceeding the culm. *Spikes* in pairs, terminal, 3–5-flowered, 2-bracted. *Tepals* equal, ovate-lanceolate, mucronate, equalling the subglobose, obtusely trigonal, mucronate *capsule.* *Stamens* 6, anthers usually exceeding the filaments.

Falklands; S. Patagon., in saline marshes along R. Deseado, and R. Sta. Cruz; Fuegia. (New Zealand?)

J. SCHEUCHZERIOIDES INCONSPICUUS Hook. (*J. inconspicuus* d'Urv.)

Small, scarcely 25 mm. high, densely cespitose; heads 1–3-flowered.

Falklands; Navarino I., Fuegia; S. Patagon., at Coy Inlet (O. A. Peterson, on pampas, Nov. 15, 1896).

17. J. STIPULARIS Nees & Mey. (*J. biflorus* Phil.)

Culm 5–10 cm. high, leafy, with ligulate, broad-margined sheaths. *Leaves* subulate, jointed by cross septa, equalling the culm. *Branches* of thyrse erect, 2–3-headed, the heads as large as a pea, 2–4-flowered, bracted. *Tepals* ovate-lanceolate, acuminate, as long as the obovate, apically trigonal *capsule.* *Anthers* shorter than the filaments.

(Chili); Magellan (Dusén); N. Patagon., along Rio Negro.

4. JUNCOIDES Adans. (1763. *Luzula* DC. 1805.)

Perennial, grass-like herbs, glabrous or sparingly cobwebby, the stems leafy, with closed leaf-sheaths. *Flowers* bracteolate, usually umbelloid or panicled. *Capsule* 1-locular, 3-seeded; *seeds* not tailed.

Species 40, widely distribted.

1. J. ALOPECURUS (Desv.).

Cespitose. *Leaves* plane, hairy on margin. *Panicle* contracted, glomerate, ovate-pyramidal, villous, erect. *Bracts* long, fimbriate-ciliate, subulately awned. *Tepals* ovate-lanceolate, narrow, subulate, dorsally fuscescent; the inner longer, carinate, awned, fimbriate, twice as long as the round, triangular, obtuse *capsule.*

Magellan and S. Patagon., mouth of Rio Gallegos (Dusén), pampas at Coy Inlet (O. A. Peterson). Fuegia, Ushuaia to Cape Horn; Falklands.

2. J. ANTARCTICUM (Hook. f. sub *Luzula*).

Small, cespitose. *Culm* 5 cm. high, slender, filiform, arcuate or erect. Leaves broad-linear-subulate, ciliate at the base. *Panicle* small, ovoid, woolly, nodding; bracteoles and *tepals* subequal, the margins hyaline, lacerate, scarious above, colored below. *Capsule* elliptical, half as long as the tepals. *Stigmas* 3, sessile-filiform.

Magellan and W. Magellan (Dusén); to high altitudes; S. Fuegia to Cape Horn.

Tepals larger than in *J. alopecurus.*

3. J. PATAGONICUM (Speg. sub *Luzula*).

Stem 20–40 cm. high, fistulous, its base fasciculate-leafy, 1 leaf at its midpart, the *leaves* grass-like, subglabrous, with callous apex. *Inflorescence* erect; *spikes* short and thick, more or less remote. *Tepals* subequal, the outer 3 lanceolate, awned, membranous, fuscous, the inner 3 obtusely acute, subhyaline. *Fruit* trigonal-ovate, just exceeding the perianth.

S. Patagon., by Lago Argentino. (By J. B. Hatcher in S. Patagon., only 10 cm. high.)

4. J. PUMILUM (Hook. sub *Luzula*).

Small, densely tufted, nearly glabrous, 30–60 cm. high. *Leaves* slender, shorter than culms, 12–25 mm. long, linear-subulate, obtuse, coriaceous, convex on back. *Culm* naked, 25–50 mm. Flowers in a small, 4–10-flowered head, 2 mm. long. *Bracts* ovate, the edges ragged. *Tepals* subulate or lanceolate, long-acuminate, chestnut-brown, twice as long as the black *capsule.*

(New Zeal., alpine); Fuegia.

5. J. RACEMOSUM (Desv. sub *Luzula*).

Root fibrous, bulbous-thickened, cespitose. *Culm* 30–70 cm. high, erect, leafy. Leaves plane or somewhat canaliculate, linear, acuminate, their sheaths pilose-margined. *Panicles* nodding, consisting of spike-like racemes. *Bracts* ciliate. *Tepals* ovate-oblong, red-castaneous, the outer acute-mucronate, exceeding the acute, round-trigonal *capsule*. *Stamens* generally 3.

(S. Amer.); S. Fuegia. (Dusén.)

6. J. SPICATUM (DC. sub *Luzula*).

Plants rarely exceeding 15–20 cm. high, densely cespitose. *Leaves* generally distinctly canaliculate. Inflorescence of simple outline or lobate; spikes short, thickish, mostly nodding. *Flowers* 2.5–3 mm. long, variegated. *Tepals* castaneous, white-margined above. Stamens 6.

(Eur., N. Amer., alpine and arctic); Patagon. (On pampas near Coy Inlet, J. B. Hatcher. 25 cm. high; panicle dense, ovate, erect. Scape with 3 leaf-like bracts near the panicle.)

Family 18. LILIACEÆ. Lily Family.

Herbs, usually with bulbs or corms, rarely woody plants. *Flowers* usually hypogynous, regular, perfect and showy. *Perianth* leaves 6, occasionally 4, similar, usually not united; stamens of the same number, inserted on the base of the perianth; *anthers* mostly extrorse. *Ovary* mostly 3-celled; *style* 1, *stigma* 3-lobed. *Seeds* many, in 2 rows in each cell. *Embryo* in the axis of copious endosperm.

Species 1,300, widely distributed.

KEY TO THE GENERA.

- *A*. Herbs, all with radical or basal leaves.
  - *b*. Flowers umbellate, when not solitary on the scape.
    - *c*. Style 3-branched. Seeds few. 1. *Allium*, p. 304.
    - *c2*. Stigma 3-lobed. Seeds numerous. Perianth united below into a tube, funnelform to campanulate. 2. *Brodiæa*, p. 304.
    - *c3*. Stigma 3-lobed. Seeds numerous. Perianth united below, salver-shaped, often with scales in the throat. 3. *Tristagma*, p. 306.
  - *b2*. Flowers paniculately racemose. Ovary 1-celled. Polygamo-diœcious. 4. *Astelia*, p. 307.
- *A2*. Branching shrubs.
  - *b*. Leaves 3–several-nerved, but not reticulate. Flowers pediceled, white. Perianth-leaves subequal. 5. *Callixene*, p. 307.
  - *b2*. Leaves reticulately veined, and
    - *c*. 1-nerved. Flowers nearly sessile, large, pink. Perianth-segments unequal, the inner much larger. 6. *Philesia*, p. 308.
    - *c2*. 3–5-nerved. Flowers very large, on slender pedicels; perianth-segments subequal. Climbing. 7. *Lapageria*, p. 309.

1. ALLIUM Linn.

Bulbous herbs, with garlic odor, linear, sheathing, usually basal *leaves*, and simple, erect *scape*, bearing a bracted *umbel* of flowers; some of the flowers in some species becoming bulbils. *Ovary* with 1–6 *seeds* in each cell; *style* shortly 3-branched.

Species 275; chiefly extratropical in the Northern Hemisphere.

A. BONARIENSE Griseb.

Bulb 8 mm. diameter. Scape 7–12 cm. *Leaves* nearly 1 mm. broad. *Umbels* 3–5-flowered; *perianth* 8 mm. long, yellow (externally purplish when dry). *Perianth-leaves* distinct. *Style* twice as long as the ovary. *Cells* of ovary 6–10-ovulate.

(Uruguay); N. Patagon.

2. BRODIÆA Smith. (Including *Triteleia* Lindl).

Corm more or less coated. *Leaves* all radical, large. *Scape* simple, bearing a terminal umbel, or 1-flowered. *Perianth* funnel- to bell-shaped, its leaves subequal. *Stamens* on the tube, 6, or 3 of them barren; filaments short; *anthers* introrse. *Style* filiform, stigma 3-lobed. *Capsule* oblong in the marcescent perianth. *Seeds* numerous, black, often compressed.

Species 30, chiefly from Calif. to Chili. (Fig. in Eng. & Prantl, ii, 5, p. 57.) Subgenus *Triteleia* has staminal circle of unequal height, filaments filiform, all antheriferous.

1. B. AMEGHINOI Speg. (=*Tristagma ameghinoi* Speg.).

2. B. AUREA (Baker sub *Milla*).

Bulb globose, about 10 mm. diameter, tunicate. *Leaves* 6–8, fleshy, synanthic, filiform, 8 cm. long. *Scapes* 1–3, erect, 5–10 cm. long. *Valves* of spathe 2, lanceolate, basiconnate. *Umbels* 2–6-flowered; pedicels 14 mm. long. *Perianth* 10–12 mm. long, saffron-colored, its segments oblong, spatulate, spreading, 3–4-times as long as the short tube. *Stamens* slightly 2-seriate from the throat. *Ovary* sessile, cells 5–6-ovuled. *Style* 3 mm. long.

(Argentina); Patagonia.

3. B. LUZULA (Speg.) Macl. (*Luzula patagonica* Speg.) (Pl. Pat. austr. n. 366.)

Perennial, with fistulous stem, leafy at base, with a single leaf midway, and grassy, subglabrous, acute leaves at top. *Inflorescence* erect, with short, thick *spikes*, rather remote. *Tepals* subequal, 3 external, lanceolate-awned, 3 internal, obtusely acute. *Stamens* 6, all antheriferous. *Fruit* trigonal-ovate.

Patagonia, through its dry parts from Rio Chubut to Rio Gallegos, varying in height, and in the perigonial lobes having broad or narrow margins, and in the varying length of the pedicels.

B. LUZULA ANGUSTILOBA (Speg.).

Larger than the species, the *pedicels* equalling or surpassing the bracts, and having larger perigonium, its albescent tube with 5 green vittæ, and its lobes very narrowly linear without white margins.

4. B. PATAGONIA (Baker sub *Milla*).

Leaves 4–5, synanthic, filiform, 15–22 cm. long. *Scape* 1-flowered, about 12. cm. long; valves of spathe 2, erect, united at base. *Pedicels* 15 mm. long; *perianth* 22 mm., pale lilac; its segments lanceolate, acuminate, erect, twice as long as the tube. Ovary sessile; style 6 mm. long.

Patagonia.

5. B. PŒPPIGIANA (Gay sub *Triteleia*).

Leaves linear, plane, sometimes exceeding the 5–7-flowered scape. *Spathe* 2(3–4)-valved, the valves lanceolate, hyaline-membranous, rose-colored, as long as the pedicels, or shorter. *Perianth-lobes* oblong-obtuse, 8 by 3 mm. *Tube* as long as the lobes.

Patagon., by the mouth of Rio Chubut. (Dusén.)

6. B. SPEGAZZINII (Speg.) Macl. (*B. patagonica* Speg. non Baker.)

Bulb ovate. *Leaves* synanthic, narrow-linear, plicate, obtusish. *Scape* slightly longer, erect, glabrous, slender, 1-flowered, 2-bracted above. *Flower* subtubular, its segments linear, acute, as long as the tube, white, marked by a green line. *Pedicel* half as long as the flower. Plant green to violascent.

Patagon., common by Rio Sta. Cruz and Golfo de San Jorge.

3. TRISTAGMA Poepp.

Corm globular, truncate. *Leaves* few, radical, linear. *Scape* simple, leafless, bearing a few-flowered umbel, with scarious, involucral bracts. *Perianth* salver-shaped, with a cylindrical tube and 6 subequal, spreading lobes; mostly scales in the throat. *Filaments* short, inserted in the throat. Ovary ovoid; seeds numerous.

Species 3, Chili; Patagon.

1. T. AMEGHINOI Speg.

Staminal series unequal. *Bulb* ovate, 3.5–5 mm. diameter, 3–5 cm. in length. *Leaves* linear, plane, apically obtuse, *Scape* as long or shorter, erect, glabrous, slender, 1-flowered, 2-bracted. *Flowers* with rather long tube, their segments narrow-linear, thickish, velvety-papillose, olivaceous.

Patagon., in sandy meadows by Golfo de San Jorge. The cylindraceous floral tube and naked throat make this resemble *Brodiæa;* but the short style and the lobes being shorter than the tube place it in *Tristagma.*

2. T. AUSTRALIS Neger.

Bracts broad, lanceolate. *Leaves* obtuse, narrowing downwards. Pedicels only 2–5 mm. long. *Perianth-tube* ventricose, the lobes short, linear, with crown of 3–6, partly connate scales. Involucre 2-bracted, the *bracts* connate.

S. Patagon., Rio Guillermo. (O. Nordenskjöld.)

3. T. EREMOPHILA Speg.

Greenish, glabrous; the synanthous *leaves* linear, obtuse, plane, equalling or exceeding the narrower scape. *Spathe* basally connate-tubular, long-bifid upwards, the lobes narrow, hyaline to reddish. *Flowers* 2–5, with very short or long pedicels, erect or subcernuous; the perigon cylindrical to sublageniform, 6-lobed, the lobes narrow-linear, fleshy, acutish, slightly shorter than the dark-purplish tube; olivaceous, with naked throat.

Chubut; in rocky hills by Carren-leofú.

4. T. NIVALIS Poepp.

Bracts very narrow, almost linear. *Pedicels* 10–30 mm. long, differing in the same umbel. *Perianth-tube* cylindrical. *Leaves* very narrow.

REESE LIB OF T UNIVE CALIF

T. NIVALIS ANGUSTIFOLIA Neger.

Leaves narrower than in the type.

E. Fuegia. (Br. Ansorge.)

5. T. PULCHELLA Speg.

Pallid green, glabrous, *Leaves* synanthous, plane, rather obtuse, equalling or exceeding the narrower scapes. *Spathes* scarcely connate-subtubular at base, bipartite; lobes broad-ovate, subobtuse, slightly albescent. *Flowers* solitary or geminate, sessile, erect, tube ovate-inflated, beautifully dark-violaceous, apically 5-lobed; the lobes arcuate-reflexed, fleshy, concolorous, nearly a half shorter.

W. Patagon., in the higher hills near Rio Aysen.

4. ASTELIA Banks & Sol.

Rhizome short, thick; stem leafy at base, supporting paniculate *racemes* of small, polygamo-diœcious flowers. *Perianth* campanulate, its leaves united below. *Ovary* 1-celled; ovules numerous. *Fruit* fleshy, indehiscent.

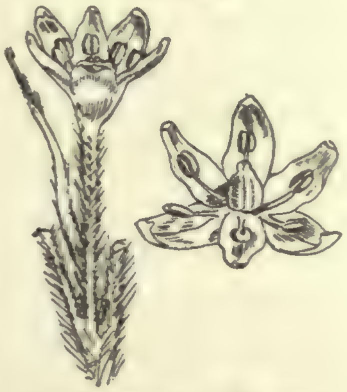
Species 9, in Pacific Is., N. Zeal., Tasm., Austral., and Antarc. Amer. (Fig. in Eng. & Prantl, ii, 5, p. 75.)

A. PUMILA R. Br.

Leaves lanceolate, rigid, glabrous on both sides, 3-nerved, serrulate at apex. *Peduncles* 1-flowered, very short, the *flowers* inconspicuous, faintly sweet-scented (Fig. 54).

Falklands; Fuegia to Cape Horn, abundant, forming most of the peat; W. Magellan, at Puerto Angusto (Dusén); Staaten I.

FIG. 54.



Astelia pumila.— Flower.

5. CALLIXENE Juss. (1789). (*Luzuriaga* Ruiz. & Pav. 1798; *Enargea* Banks.)

Glabrous, branching shrub, with subsessile, prominently 3–many-nerved *leaves*, and white axillary *flowers* on slender pedicels. *Perianth-leaves* not united, spreading, subequal, nerveless, spotted. *Berry* subglobose, 3-celled, with few pallid seeds. (Eng. & Prantl, ii, 5, p. 86.)

Species 3, Chili, and the following.

1. C. MARGINATA Lam.

Knotted and leafless at the base. *Leaves* coriaceous, narrow-oval, thick at margin and midrib, subcuspidate. Flowers fragrant. *Filaments* filiform, anthers large, reflexed and extrorsely reversed. Berry dark purple.

Patagon.; Magellan to W. Magellan; Fuegia, Beagle Ch. to Cape Horn; Staaten I., Falklands; N. Zeal.

In Fuegia, "growing prostrate and against the trunks of beech trees"; in N. Zeal., "on mosses by woods." "Seems a transition towards *Philesia*, which the distribution favors."

2. C. POLYPHYLLA Hook.

Tall; much branching. *Leaves* abundant, oblanceolate or subovate, mucronulate, 5–7-nerved, with faint cross veins, glaucous underneath. *Peduncles* about as long as the leaves, below their middle articulated and 1-bracted. *Petals* white, acute, orange-spotted. *Anthers* incumbent.

S. Chili, at Cape Tres Montes; called "Asaju"; growing on trunks of trees, about 30 cm. long; remarkable for its beautiful flowers.

3. C. RADICANS Ruiz. & Pav.

Suffruticose, glabrous, several meters high. *Stem* terete, slender, flexuous, creeping along trunks of trees, jointed, sheathing and rooting at the joints, rootlets long, simple. *Leaves* sessile, lanceolate, oblique, acuminate, 9–13-nerved on both sides, 25 mm. long. *Peduncles* 2–4-flowered; *flowers* variegated, white to yellow, with red points and lines. *Berry* red.

(Chili); W. Patagon. (Dusén.)

6. PHILESIA Comm.

Glabrous, branching shrub, with nearly sessile, subdistichous, oblong, coriaceous, revolute-edged, 1-nerved, reticulate *leaves;* and large, showy, pink *flowers*, 1 or few in the upper axils or terminal; with few small imbricating *bracts;* inner *perianth-leaves* obovate-oblong, twice as long as the outer. *Anthers* extrorse. *Ovary* 1-celled, with 3 parietal *placentæ*. *Fruit* a subglobose berry, with many seeds.

Only species:

P. BUXIFOLIA Lam. (*P. magellanica* Gmel.) Plate XIII.

Flowers bell-shaped, 5 cm. long (smaller than in *Lapageria*), at right angles with the axis; *glands* at base of the inner perianth.

E. and W. Magellan; Cordilleras of S. Patagon. (in flower Dec. 20–Feb. 16; a shrub reaching to nearly 2 meters high—J. B. Hatcher); Fuegia to near Cape Horn. "Among the handsomest of the Antarctic American Flora. Northwards to Valdivia it is replaced by *Lapageria rosea*." (J. D. Hooker.) When not in flower it is difficult to determine its character as a monocot.

7. LAPAGERIA Ruiz. & Pav.

Branching, climbing shrub, with coriaceous, 3–5-nerved, reticulate *leaves*, whose short petiole is jointed below the blade, the lower part persisting-twisted. *Flowers* 1–few in the axils or terminal, large and handsome, with short peduncle and numerous small imbricate bracts. *Perianth-segments* distinct, connivent, the outer narrower; a basal nectary inside. *Anthers* introrse. *Ovary* 1-celled, with 3 parietal placentæ. *Berry* ovoid, subtrigonal, with many seeds.

Only species:

L. ROSEA Ruiz. & Pav.

Leaves lance-ovate to subcordate, acuminate. *Flowers* flesh-colored, sometimes white.

(S. Chili; also cult. in greenhouses); Patagonia (?).

Family 19. AMARYLLIDACEÆ.

Herbs (or tropical shrubs) from rhizomes or bulbs, with usually narrow, entire *leaves*, and large, showy, perfect *flowers*. *Perianth-leaves* 6, mostly united below, bearing 6 *stamens* on their base. *Ovary* wholly or partly inferior, 3-celled; style simple or 3-lobed. *Fruit* a many-seeded capsule; or fleshy and 1–3-seeded. *Seeds* oblong, mostly black.

Species 800, chiefly in warm countries.

KEY TO THE GENERA.

A. Rootstock bulbous.
  *b*1. Scape 1-flowered. Capsule 3-lobed. 1. *Zephyranthes*, p. 310.
  *b*2. Umbel 2–many-flowered. Capsule 3-celled. Anthers dorsifixed. 2. *Hippeastrum*, p. 310.
*A*2. Rootstock fasciculate. Capsule wrinkled. Terminal inflorescence or 1-flowered. Anthers basifixed. 3. *Alstrœmeria*, p. 311.

1. ZEPHYRANTHES Herb.

Glabrous herbs, with a *bulb* sending up narrow *leaves*, and a hollow, leafless 1-flowered *scape*. *Perianth* funnelform, usually with scales in its throat. Style 3-lobed. Capsule subglobose, 3-lobed.

Species 30, New World, from Tex. southward; 1 in W. Afr.

1. Z. ANDERSONII (Herb.) Benth.

Stamens unequal, declined (but often normal). *Perianth-scales* united into a membrane at the base of the filaments; anthers dorsifixed. (Fig. in Eng. & Prantl, ii, 5, p. 107.)

(Argentina); N. Patagon. Has golden-copper-colored flowers; and springs up commonly after rains.

2. Z. MELANOPOTAMICA Speg.

Euzephyranthes. *Bulb* ovoid, mediocre, fuscous-tunicate. *Leaves* narrow-linear, long, green, not synanthous. *Scapes* erect, more or less elongate, terete, glabrous. *Spathes* elongate, bifid below the middle, more or less long-connate, whitish. *Flowers* solitary or paired, erect, pedicels shorter than spathe. *Perianth* turbinate, mediocre, its leaves oblanceolate, acutish, white, twice as long as the unequal glabrous *stamens*, basally short-tubular-connate. Interstaminal scales small, pectinate-ciliate. *Style* rather long, included, trifid.

N. Patagon., in dunes along Rio Negro. Differs from *Z. mesochloa* Herb. by the leaves not being synanthous, and by the ciliate-pectinate character of its interstaminal squamules.

2. HIPPEASTRUM Herb.

Coated *bulb* sending up a fistulous *stem* with strap-shaped *leaves*, and a 2–many-flowered *umbel* (rarely 1-flowered), often large; with 2 distinct involucral bracts, often enclosing 1–many inner linear or filiform *bracts*. *Perianth-tube* short or long, the limb often zygomorphous. *Filaments* short; *anthers* dorsifixed, versatile. *Crown* of scales about or between the stamens small. Ovary 3-celled. *Seeds* many, black.

Species 50, in subtropical Amer. Section *Habranthus* has broad funnelform flowers, few in the umbel, and narrow leaves.

1. H. BAGNOLDI (Hrb.) Baker. (Baker's Handbook of Amaryllid., p. 43.)

H. BAGNOLDI MINUS Speg.

The variety has the *umbel* usually 2-flowered, and is smaller every way. *Bulb* subglobose. *Leaves* linear, 15–25 cm. long, subglaucescent. *Spathe* 2-leaved, yellow to white. Perigonium infundibuliform, yellow to rose or ferruginous, its leaves lanceolate, acute both ways. *Stamens*, 3 short, 3 long, anthers versatile. Interstaminal squamules minute, fimbriate. *Style* as long as the floral-leaves, shortly trifid.

Chubut, in meadows near Puerto Piramides.

2. H. PALLIDUM (=*Hippeastrum advenum* Herb. *Loddiges* sub *Habranthus*) Pax. (=*Habranthus hesperius* Herb.)

Leaves narrow-linear, subobtuse, fleshy, from the ovoid bulb. Scape leafless, 2-flowered. Flowers rather large, free-segments of broad funnelform, yellowish-white to red perianth, ovate, acute.

(Description made from the Loddiges, *Botan. Cabinet*, plate 1760.)

(Chili); Chubut, meadows by Carmen-Leofú: sandy hills.

3. ALSTRŒMERIA Linn. p. p.

Rootstock fasciculate. *Stem* simple, erect, leafy, ending in an *umbel* or *raceme* of leafy-bracted flowers, or a solitary flower. *Perianth* funnelform, its leaves nearly distinct, one of each series unlike the other two; inserted with the *stamens* on an epigynous persisting ring. *Anthers* basifixed. *Capsule* globose, rugose, with an annular crown. Seeds many, globose.

Species 30, S. Amer.

1. A. AURANTIACA Don.

Flowering stem reaching 1 meter high. *Leaves* 40–50, lanceolate, subpetiolate, glaucous beneath, the lower 10 cm. by 12 mm. *Umbels* 10–30-flowered, with long compound rays; the *bracts* leaf-like. *Perianth* bright yellow, 4 cm. long, *outer tepals* subobtuse, green-tipped, 12–14 mm. broad; the *inner* narrower, deeper in color, claret-brown spotted. *Stamens* declinate, shorter than the tepals.

(Chili; cult. in gardens); Patagon.

2. A. DIAZI Phil.

Stem tall (30 cm.), leafy. *Leaves* rather crowded, not resupinate, lance-linear; involucral leaves similar. *Umbels* 3-flowered; peduncles scarcely exceeding the involucre, naked. *Outer tepals* obovate-spatulate, not emarginate, serrulate, pink, their base and center white; the *inner* larger, purple-lined, yellow in the center; the lowest shorter, spotless.

(Amer.); Patagon., Chubut, in dry sandy hills.

3. A. LIGTU Linn.

Scape 45–60 cm. *Leaves* 20–30, thin, ascending, linear or lanceolate, 5–7 cm. long, .5–1 mm. broad. Umbel 3–8-rayed, rays often forked, 5–7 cm. long; bracts several, linear, 25–35 mm. long. Perianth 35 mm. long; the outer segments obovate, unguiculate, obtuse or cuspidate, 12 mm. broad, whitish or pale lilac or pale red, with oblique, purple streaks, the inner segments narrower and more acute. Stamens shorter than the segments.

Patagon., meadows near Lago Nahuel-huapi; along Rio Chubut.

4. A. PATAGONICA Phil.

Low, 1-flowered. *Leaves* linear, narrowed at base, acute, undulate. *Flower* 18 mm. long, its outer leaves spatulate, mucronate, yellow inside, pinkish halfway on outside; inner perianth-leaves narrower, purple-spotted to the middle. Stigmas revolute, elongate, broad, margined. Leaves more numerous and narrower than *A. pygmæa*, and inner tepals red-spotted.

Near Lago Sta. Cruz, Patagon.; S. Patagon., on high dry pampas near Coy Inlet (Hatcher); "yellow, with dark spots on the corolla."

5. A. PYGMÆA Willd. (*A. ligtu pygmæa* O. Ktze.)

Underground stem 5–10 cm. long, sending up a dense tuft of linear or lanceolate *leaves*, 12–25 mm. long. *Flower* solitary, sessile amid the leaves; its *perianth-leaves* oblanceolate, unguiculate, whitish, unspotted, 12–18 mm. long, 2–3 mm. broad. *Stamens* as long. "Flower unspotted."

(Peru and Bolivia to 4,000 meters); Gregory Bay, Fuegia, by R. O. Cunningham; N. Fuegia, near sea-coast, Dusén.

Family 20. IRIDACEÆ. Iris Family.

Perennial herbs, with narrow mostly equitant, distichous *leaves*, and perfect, mostly regular, showy *flowers* in spathes. *Perianth* 6-parted, in 2 series, its tube adhering to the inferior 3-locular *ovary*. *Stamens* 3, on the base of the outer tepals; *anthers* extrorse. *Style* 3-cleft, its branches often petaloid and subdivided. *Embryo* enclosed in horny or fleshy endosperm.

Species 1,000, cosmopolitan.

GENERIC ANALYSIS.

A. Style-branches forked. Bulbous plants. Tepals subsimilar.	1. *Nemastylis*, p. 313.
A2. Style-branches simple. Usually with rhizomes.	
b. Filaments free, or connate only at base.	2. *Libertia*, p. 313.
b2. Filaments partly united into a tube.	
c. Spathe many-flowered.	
d. Perianth-tube short	3. *Sisyrinchium*, p. 314.
d2. Perianth-tube rather long.	4. *Symphyostemon*, p. 318.
c2. Spathe 1-flowered. Low, cespitose plants.	5. *Tapeinia*, p. 319.

1. NEMASTYLIS Nutt.

Bulbs usually sending up branching stems with long, linear, folded *leaves*, and 1 or more pediceled *flowers* from the spathe. *Tepals* all similar, fugacious. *Filaments* partly united. *Style-branches* filiform, themselves forked, alternate with the anthers. *Capsule* subovoid.

(Fig. in Eng. & Prantl, ii. 5, p. 148.)

Species 10, S. Amer. and N. to Tenn.

N. FURCATA Klatt.

Stem 25 cm. high, simple below, flexuous, glabrous; *leaves* long, lance-ensiform, the base broad-sheathing; cauline leaf basi-cucullate. *Bracts* ovate-lanceolate, keeled, cuspidate, thin-margined. Spathe 1-flowered, 2-valved. *Flowers* erect, yellow, *anthers* yellow. *Seeds* castaneous.

(Montevideo); N. Patagon.

2. LIBERTIA Spreng.

Rhizomes creeping. Leaves basal, distichous; the few *stem-leaves* reduced. *Flowers* in simple or compound umbels, the *inner tepals* larger than the outer, white or greenish; stamens 3, free or basi-connate; styles alternate with the anthers, involute-filiform, the *spathes* not enclosing the pediceled flowers.

Species 8, some in Chili, others in N. Zeal. and S. Australia. (Fig. in Eng. & Prantl, ii, 5, p. 150.)

1. L. ELEGANS Poepp.

Panicle of many peduncled, 4–6-flowered umbels. *Inner perianth* white, outer green. *Filaments* connate.

(Chili); by R. O. Cunningham (in Patagonia?).

2. L. FORMOSA Graham.

Stem terete, leafy; radical leaves not equalling the stem, smooth-edged. Outer tepals ovate, carinate, greenish at apex; inner tepals unguiculate, cordate, retuse; fruits smaller than the flowers.

(S. Chili); Valdivia. (Fig. in Eng. & Prantl, l. c.)

3. SISYRINCHIUM Linn.

Rhizomatous, slender herbs, with narrow *leaves*, radical or from the base of the stem, and single terminal *spathe*, or with additional spathes sessile along the stem. *Tepals* all similar, often awned. *Style-branches* filiform, undivided, alternate with the anthers. *Capsule* ovoid or globular.

Species 50, chiefly in warm parts of Amer. and stragglers in Austral., Mauritius, Ireland, Bermuda; several in E. U. S. (Fig. in Brit. & Br. i, 453.)

A. Dwarf.	
b. Stem low, densely leafy, about 1-flowered.	*humile.*
b. Stemless, with yellow flowers.	*clarazii.*
*A*2. Filaments free from near the base.	*filifolium.*
*A*3. Filaments free upwards. Flowers expanded, yellowish.	
b. Scape subcompressed; leaves grass-like.	*graminifolium.*
*b*2. Scape compressed. Tepals, 3 of them with large, dark spots.	*maculatum.*
*b*3. Scape narrowly winged; tepals brown-striate.	*striatum.*
*b*4. Stem flat and winged; tepals brown-striate.	*patagonicum.*
*A*4. Filaments connate; flowers expanded, blue or pink to white, with purple stripes.	
b. Stem 2-winged; tepals subspatulate, retuse, mucronate.	*chilense.*
*b*2. Stem 2-edged; tepals hairy outside.	*iridifolium.*
*b*3. Stem terete, and leaves terete. Flowers pink.	
c. Stem striate, leafy below.	*junceum.*
*c*2. Stem with a leaf some distance below.	*middletoni.*
*c*3. Stem smooth, naked.	*roseum.*

1. S. CHILENSE Hook.

Stem branching, 2-winged. *Leaves* linear-ensiform, acutish, striate, much shorter than the scape. *Spathes* linear, acute, usually exceeding the pedicel. *Tepals* oblong, subspatulate, retuse, mucronate.

(Trop. Amer.); N. Patagon.; S. Patagon.; E. and S. Fuegia (Dusén).

2. S. CLARAZII Baker.

Dwarf acaulescent, tufted, yellow-flowered, with a 2-edged *flower-stalk*, rigid, 7-ribbed *leaves* about 1 mm. broad. *Perianth* 6 mm. long.

Probably in N. Patagon. It and *S. chilense* are used in infusions for tea.

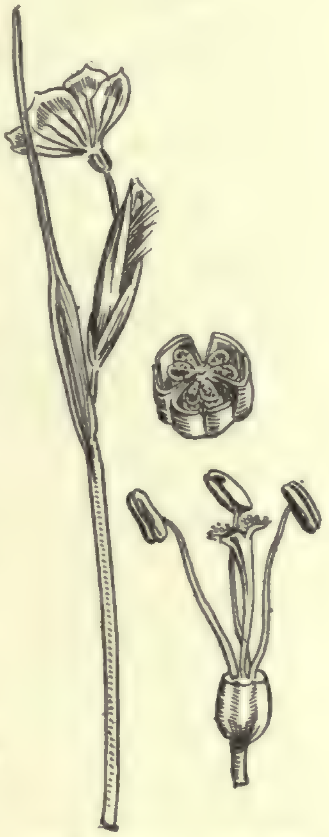
3. S. FILIFOLIUM Gaudich. (*S. leucanthum* Colla.)

Stem terete, striate, several (2–8)-flowered. *Leaves* radical, filiform, nearly equalling the scape, produced beyond the bracts to a long spathe. *Flowers* showy, broad-campanulate, 12 by 12 mm., the *tepals* obovate, subequal, white with purple veins. Filaments free nearly to the base. *Capsule* glabrous, its cells 3–6-seeded (Fig. 55).

S. Patagon., Fuegia; Falklands. By O. W. Peterson and J. B. Hatcher, near Coy Inlet, at Cobo Negro, and near head of Rio Chico de Sta. Cruz; at Killik Aike on Rio Gallegos (Dusén); "Stargrass; color white with brown stripes. Handsomest and most fragrant in Patagonia. On pampas everywhere." (Peterson.) "White at high latitudes, pink at lower." (Hatcher.) "In the Falkland Islands the grassy plains are, in the spring month of November, almost whitened by the profusion of its pendulous snowy bells." (J. D. Hooker.)

(Index Kewensis gives *S. filifolium* and *S. leucanthum* as distinct species. Klatt identifies them.)

FIG. 55.



Sisyrinchium filifolium. Inflorescence and flower; essential organs, and cross-section of dehiscing fruit. (After *Flora antarctica.*)

4. S. GRAMINIFOLIUM Lindl.

Scape 60 cm. high, subcompressed. *Leaves* erect, 6–10 mm. wide, strongly striated, glaucous, rigid, exceeding the scape. *Capsules* shorter than the pedicels, ovoid-globular.

S. Patagon., Eden; E. Fuegia. (Br. Ansorge.)

5. S. HUMILE Phil.

Stem only 10 cm. high, densely leafy, about 1-flowered, the *leaves* distichous, acute, 5–10 cm. long, exceeding the flower, "Cetera *S. cuspidati.*" (Chili); S. Patagon., by Rio Sta. Cruz; Gregory Bay.

6. S. IRIDIFOLIUM (Humb. & Bonpl.) Kunth. (*S. laxum* Link.)

Stem branching, leafy, 2-edged; its edges and the leaf-edges scabrid. *Spathes* terminal, glabrous; peduncles geniculate. *Tepals* ochroleucous, hairy below externally. *Staminal* column inflated, bearded below. *Ovary* pubescent; *capsule* glabrous.

(Caraccas to Chili); Magellan; Fuegia (Speg.). Often confounded with *S. chilense.* "N. Patagon." (Lor. & Nied.)

S. IRIDIFOLIUM MAJUS. (*S. laxum* var. *major.*)

Stem bifid. *Leaves* and *tepals* broader. *Spathes* and *bracts* scaberulous above.

W. Patagon., in Chonos Archipelago.

S. IRIDIFOLIUM MINUS.

Stem simple. *Leaves* narrower, glabrous. *Tepals* narrower.

Magellan.

7. S. JUNCEUM Meyer. (*S. gracile* Phil., *S. junciforme* Poepp.)

Glabrous. *Stem* terete, striate, one third way leafy. *Leaves* terete, striate, shorter than the scape. One valve of the *spathe* long, straight. *Flowers* in a lateral fascicle, pink; *tepals* lanceolate, acute, 3–5-striate. *Staminal* column inflated. *Stigmas* small, dentiform. *Capsule* oblong.

(Andes); Fuegia, Navarino I., Ushuaia; Patagon., Chubut; Valley of R. Gallegos (Nordenskj.); R. Sta. Cruz.

S. JUNCEUM BREVISPATHUM (O. Ktze.).

About 30 cm. high; few-flowered. *Spathe* scarcely exceeding the inflorescence.

Patagon.

S. JUNCEUM FLORIBUNDUM Phil.

To 60 cm. high; many-flowered. Spathe scarcely exceeding the inflorescence.

Patagon.

S. LEUCANTHUM Colla (see *S. filifolium*).

8. S. MACULATUM Hook.

Stem leafy, ancipitally-compressed. *Leaves* linear, ensiform. *Pedicels* as long as the spathe, white-membranous, acuminate. *Perianth-segments* obovate, acute, 3 with large, dark, sanguineous spots. *Stigmas* subulate. *Ovary* glandular. Herb scarcely exceeding 30 cm. high, with a *panicle* of several yellow flowers.

(Chili); S. Patagon.; Fuegia, in dry meadows.

9. S. MIDDLETONI Bak. (*S. roseum* Speg., Pl. Pat. Aust. n. 357, non Ph.)

Root fibrous, densely tufted, long-cylindrical. Stem slender, terete, erect, a foot long, ending in a single cluster of flowers, with a terete leaf some distance below. Leaves 2–3, slender, terete, half as long as the stem. Spathes 1–2-flowered, 25–32 mm. long; valves lanceolate, green, with narrow white edge. Perianth-segments oblanceolate-oblong, 8 mm. long. Filaments connate to the apex in an ampulliform tube.

S. Patagon., meadows by Rio Sta. Cruz; Golfo de San Jorge; by Rio Chubut.

10. S. PATAGONICUM Phil.

Root-fibers slender. *Stem* simple, leafless, 12–15 cm. high, flat, winged to base, 2 mm. diam. *Leaves* linear, 2 mm. diam., shorter than the stem. *Flowers* 2–3 in a cluster. *Valves* of spathe lanceolate, 25–35 mm. long; *pedicels* much shorter. *Perianth* 8 mm. long, yellow, with brown veins. *Filaments* 3 mm., connate upwards; *anthers* small, oblong.

W. Patagon., by Rio Palena.

11. S. ROSEUM Phil.

Stems terete, smooth, 30 cm. high, scarcely 2 mm. thick, naked, produced to a long spathe. *Leaves* terete, striate, shorter than the scape. *Spathes* broadly scarious. *Pedicels* exserted. *Flowers* pink, 14 mm. long, *tepals* 7-nerved. *Staminal* column inflated midway, glabrous, scarcely half as long as the perianth. *Ovary* villous.

(Chili); Patagon., Golfo de San Jorge.

12. S. STRIATUM Smith.

Root-fibers slender. *Stems* stout, narrowly winged, 45–60 cm. high, bearing 1–2 reduced leaves above, next the inflorescence. *Spike* or panicle of many diverging sessile clusters; each 12–20-flowered, and subtended by a large ovate *bract*. *Root-leaves* 8–10, fine-linear, 30 cm. by 12 mm. Valves of *spathe* under 25 mm.; inner valves numerous, membranous.

Perianth 18 mm. long, its segments oblanceolate, pale yellow, veined with brown. *Filaments* united half-way. *Capsule* globose, 6 mm. diam.

(Chili & Andes., cult.); Patagon., in foothill and mountain meadows.

S. STRIATUM MICROSPATHUM (Phil.).

In rocks by Nahuel-huapi.

4. SYMPHYOSTEMON Miers. (*Susarium* Phil. p. p.)

Roots fibrous. *Leaves* linear, radical. *Scapes* short, amid the leaves or longer, sometimes 1-leaved. *Spathes* 1–2, sessile or stalked, each with pediceled flowers. *Perianth* funnelform, its *tepals* distinct, white, yellow or purple-striped. *Filaments* united. *Style branches* clavate. *Capsule* ovoid, protruding from the spathe. *Seeds* angled.

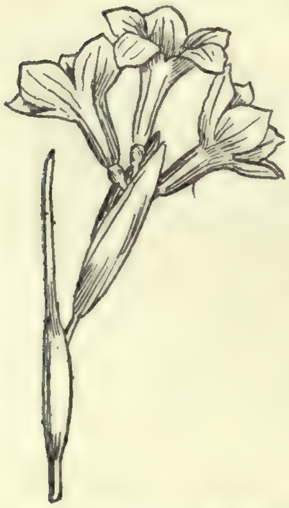
Species 5, extratrop., S. Amer.

1. S. BIFLORUS (Thunb.) Bak. (*S. narcissoides* Cav., Miers.)

Rhizome none. *Radical* fibers tufted. *Leaves* numerous, narrow-linear, 15–30 cm.; *scape* terete, 30–45 cm. long; bearing 1–2 long-peduncled clusters. *Spathes* 4–5-flowered, 25–35 mm. long, the outer valve oblong-lanceolate, green, with a membranous edge. *Pedicels* long. *Perianth* pale-yellow, 30–37 mm. long; the *segments* oblong, acute, equalling the funnel-formed tube. *Filaments* free above, *anthers* versatile. *Capsule* subglobose, 6–8 mm. diameter.

(S. Chili); Magellan; N. & E. Fuegia, "belonging to the Steppe-Flora." (Dusén.) "Blue-white bells streaked with purple." (R. O. Cunningham.) Got by Hatcher at Rio Coy.

FIG. 56.



Symphyostemon lyckholmi. Inflorescence and flowers (after Dusén).

2. S. LYCKHOLMI Dusén.

Root fasciculate. Stem erect, terete, rough, simple. Radical leaves 2–3, rough, linear-terete, attenuate-sheathing. Outer bracts 2, shorter than the upper leaf, lanceolate, embracing each other, white, scarious-margined. Flowers 3–4, their pedicels scarcely exceeding the bracts; their tube dilated upwards, their 5–6 lobes broad, subacute, with purplish lines. Filaments united (Fig. 56).

Differs from *S. patagonicus* Speg. by its rough stem and leaves, and its broad, less pointed tepals.

S. Patagon., at 600 m. elevation. O. Nordenskj.

3. S. ODORATISSIMUS (Lindl.) Miers.

Flowers larger than in *S. patagonicus*, and perigonial tube shorter.

Patagon., Golfo de San Jorge, RR. de Sta. Cruz et Gallegos; Gregory Bay.

4. S. PATAGONICUS Speg.

Glabrous. Roots fascicled. Leaves narrow, shorter than the stem, callous-mucronate. Flowers numerous, pediceled, somewhat salver-shaped and nutant; the lobes erect, ovate, apiculate, marked by 5 longitudinal, rather broad dark purple lines, exceeding the slender, cylindrical tube. Scape 15–25 cm. high, bearing a single leaf above the middle, also 2 apical bracts, mutually embracing. Ovary obconical-turbinate, 4 by 2.5 mm. Flowers smaller than in *S. biflorus*, but their tube longer.

Patagon., on sandy plains by Golfo de San Jorge.

5. S. SEGETHI (Phil. sub *Susarium*).

Rhizome and stem creeping. *Leaves* terete, hollow, rigid, equalling the scape, 24 cm. high. *Flowers* subsessile, fascicled, violaceous. *Flower-tube* very narrow, *filaments* united. *Ovary* lanceolate. *Seeds* winged above and below.

(Chili); Patagon., in dry meadows by Teka-choique and Carren-leofú.

5. TAPEINIA Juss.

Low, cespitose perennials, with fibrous *roots*, crowded, distichous, linear *leaves*, and terminal *scape* with 1-flowered pedicel which scarcely exceeds the leaves. *Perianth* bell-shaped, with the tube almost wanting, its *tepals* ovate, the inner narrower. *Filaments* united below. *Style* filiform, its branches subulate. *Capsule* globular, 3-furrowed, dehiscing at the apex.

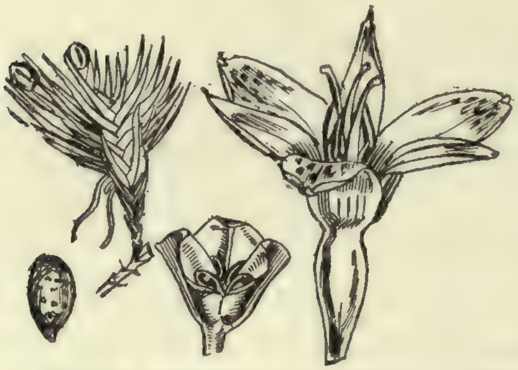
The only species.

T. MAGELLANICA (Lam.) Ker.

Leaves subulate, canaliculate, rigid. *Flowers* small, whitish-yellow (Fig. 57).

(Chili); Magellan, and W. Magellan (Dusén); Fuegia to Cape Horn. Extends farther S. and to greater elevations than the species of *Sisyrinchium.* Moist meadows, especially on mountains.

Fig. 57.



Tapeinia magellanica. Leafage, flower, seed, and dehisced capsule. (After *Flora antarctica.*)

Family 21. ORCHIDACEÆ.
Orchid Family.

Perennial, tuberous, or rhizomatous, or epiphytic herbs, with entire sheathing *leaves*, and superior perfect, zygomorphous, showy *flowers.* *Perianth* 2-seriate (calyx and corolla both petaloid), each 3-leaved; the *sepals* all similar; the 2 lateral *petals* or 'wings' similar; the third petal becomes anterior by torsion, and forms a *labellum*, being also frequently spurred. *Stamens* 1–2, gynandrous; only 1, rarely the two, antheriferous; *pollen* cohering in 2–8 pear-shaped masses. *Ovary* inferior, 1-celled, with 3 parietal *placentæ*, often long and twisted, its *style* united with the staminal column in a *gynandrium*, forming a stigmatic *rostrum.* *Seeds* exceedingly numerous and minute, having no endosperm.

Species 5,000, abounding most in the tropics.

KEY TO THE GENERA.

1. Single leafy stem with a terminal spike or raceme. *Chloræa.*
2. Leaves whorled about midway on a 1-flowered scape. *Codonorchis.*

1. CHLORÆA Lindl. (Including *Asarca* Lindl.)

Anther 1, erect behind the rostrum, 2-celled, and each cell partially 2-celled. *Pollinia* 2-parted, oblong. *Rhizomes* bearing simple leafy stems with flowers on a terminal spike or raceme. *Posterior sepal* sometimes erect, arched. *Petals* narrow, the *labellum* incurved, ascending from the base of the column, spurless, open on the upper side, and sometimes with 2 *calli.*

Species 80, confined to extratropical S. Amer.

KEY TO THE SPECIES.

A. Stem leafy.
  b. Leaves dimorphous; the basal narrow-lanceolate, long-petiolate; the upper broad and sheathing. Flowers large and whitish. *bugainvilleana.*

b2. Leaves oblong-lanceolate, obtuse, petiolate; the cauline acute, sessile; flowers very yellow. *commersonii.*

b3. Leaves lanceolate, acute; bracts large. *gaudichaudii.*

b4. Stem with 3 leaves, which wither at anthesis. Bracts sheath-like, linear-ligulate. *penicillata.*

A2. Leaves chiefly basal.

b. Leaves lanceolate, acuminate. *kingii.*

b2. Leaves subelliptical, obtuse.

c. Spike 3–7-flowered. Bracts ovate-lanceolate. *magellanica.*

c2. Spike long, lax; bracts lanceolate. *odoratissima.*

A3. Spike 16 cm. long, about 18-flowered. Lower bracts longest, all exceeding the flowers. Labellum rhombic, lobed. *patagonica.*

A4. Flowers rose-white.

b. Spikes 10–15-flowered; flowers small; labellum partly pectinate. *albo-rosea.*

b2. Spike 10-flowered; flowers large; labellum serrate-toothed, warty. *pleistodactyla.*

b3. Spike 3–6-flowered; flowers large; wings and entire labellum yellowish. *spegazziniana.*

b4. Spike 2–3(6)-flowered; flowers obscure; labellum 2-lobed, papillose. *hystrix.*

A5. Spikes 2–3-flowered; flowers large, green-white; labellum 3-toothed. *leontoglossa.*

A6. Spikes 2–4-flowered; flowers rusty; labellum 3-lobed. *ferruginea.*

1. C. ALBO-ROSEA Kraenzlin & Speg.

Spikes 10–15-flowered. *Flowers* small, the wings apically very thick-clavulate. *Labellum* short, apically obtuse-callous, the rest densely pectinate-fimbriate. *Tepals* rose-white; bracts rose colored.

S. Patagon., in elevated meadows along Rio Chico; by Rio Carrenleofú.

2. C. BUGAINVILLEANA Franchet.

Stem 15–30 cm. high. *Leaves* dimorphous, narrow-lanceolate and long-petioled in sterile fascicles, and ovate cauline leaves, the upper being long-sheathing, short and complicate. *Flowers* 4–7, rather large, with short pedicels. *Bracts* ovate, mucronate-setaceous, embracing the flower. Perianth white, tesselated with black lines; *sepals* longer than the petals. *Labellum* long-stipitate, obscurely 3-lobed, 7-crested, with inflexed fimbriate margins.

Magellan (Commerson, 1767).

3. C. CHICA Krnzl. & Speg.

W. Patagon., not rare in the woods along Rio Aysen. (To be described in F. Kraenzlin's *Monograph of Chloræa.*)

4. C. COMMERSONII Brongn. (Lindl. sub *Asarca.*)

Stem leafy. Lower *leaves* oblong-lanceolate, obtuse, petiolate; upper acute, sessile. *Spikes* dense; bracts lanceolate, acute, as long as the ovary. *Perianth* very yellow; the sepals narrow, acute; the *petals* shorter, obtuse; the *labellum* still shorter, its lateral lobes round, entire, its midlobe ovate, warty; adnate to the base of the short, winged gynandrium.

Magellan; Fuegia, Ushuaia; Falklands. Patagon., in woods near Lago Fontana.

5. C. FERRUGINEA Krnzl. & Speg.

Spikes 2–4-flowered, *flowers* slightly large, all more or less intensely ferruginous; *wings* acute, not or scarcely callous-thickened. *Labellum* trilobate; midlobe narrow, its upper surface densely and minutely papillose-verrucose.

Patagon., frequent in colline meadows near Rio Carren-leofú.

6. C. HYSTRIX Krnzl. & Speg.

Spikes 2–3-, or even 6-flowered; *flowers* rather obscure, like *C. leontoglossa*, but wings more thickened at the apex. *Tepals* white-rose, more nervose-reticulate. *Labellum* apically callous-bilobed, medially enlarged, densely hirt-papillose.

Patagon., hills between Teka-choique and Carren-leofú.

7. C. GAUDICHAUDII Brongn.

Stem leafy, the *leaves* lanceolate, acute. *Bracts* large, lance-ovate, exceeding the ovary. *Sepals* ovate-lanceolate, membranaceous to the apex. *Petals* subequal, obtuse; the *labellum* shorter, its lateral lobes fimbriate, thick at the apex, its midlobe linguæform, warty. *Gynandrium* as long as the labellum, its rostrum winged.

Magellan, moist pastures of Fuegia and Falklands.

8. C. KINGII. (Hook. f. sub *Asarca.*)

Radical *leaves* 15 cm. long, lanceolate, acuminate. *Spike* 6–8-flowered. Lateral *sepals* lanceolate, acuminate. *Petals* oblong, ovate, obtuse, slightly shorter than the sepals and the labellum; *labellum* shortly unguiculate, oblong, obtuse, entire, its nerves scarcely thickened. *Gynandrium* short.

Magellan.

9. CHLORÆA LEONTOGLOSSA Krnzl. & Speg.

Spikes 2–3-flowered; *flowers* erect, rather large. *Wings* greenish, rather fleshy on the anterior part; the other *tepals* whitish, laxly and finely fuscous-striate and reticulate. *Labellum* somewhat short, apically 3-dentate, and callous.

Patagonia, in woods near Lago Fontana.

10. C. MAGELLANICA Hook. f.

Stem 30–45 cm. high. *Leaves* elliptical and lance-elliptical, obtuse, the upper subacute. *Spike* 3–7-flowered. *Bracts* ovate-lanceolate, exceeding the ovary. *Flowers* pale-yellow; the sepals linear, thickened distally and the apex inflexed. *Petals* one third shorter, ovate-obtuse; *labellum* ovate-cordate, obsoletely 3-lobed, shorter than the sepals, margins inflexed with long glands, the axis crested; the lobes sublacerous laterally, and produced medially.

Magellan (Hatcher); N. Fuegia (Dusén). Navarino I.; Ushuaia. S. Patagon., by Rio Gallegos (O. Nordenskjöld); by Lago Argentino.

11. C. ODORATISSIMA. (Poepp. sub *Asarca.*)

Leaves elliptical-oblong, subobtuse. *Spike* long, lax. *Bracts* lanceolate, exceeding the ovary, apically incurved. *Upper sepal* oval, acute; lateral ones lanceolate-acuminate, thickened. *Petals* obliquely oval, subobtuse. *Labellum* with base adnate to the short gynandrium, its lateral lobes oboval, obtuse, its terminal longer and narrower, apex dentate.

Falklands; Patagon., south provinces.

12. C. PATAGONICA Phil.

(Leaves and stem unknown.) *Spike* many-flowered. Upper sepal lanceolate, lateral ones linear, thickened apically. *Petals* falcate, their margin concave, warty. *Labellum* rhombic, obsoletely lobed, veins of lateral lobes varicose, the apex few-toothed, with central falcate setæ; midlobe triangular, toothed, varicose-edged.

Patagonia, near Valdivia.

13. C. PENICILLATA Reichb. f.

Stem 30 cm. high, bearing 3 *leaves*, these emaciate at anthesis; bracts sheath-like, linear-linguæform, exceeding the trigonal *ovary*. *Sepals* and *wings* apically ligulate. *Labellum* cuneate, ligulate at the base, puberulous in the mid-line, anteriorly revolute on both sides; the margins with narrow, subulate processes, which are opposed internally by triangular calli; also an apical obtuse callus.

Beautiful. Patagon., Fuegia, Orange Harbor.

14. CHLORÆA PLEISTODACTYLA Krnzl. & Speg.

Spikes long, about 10-flowered. *Flowers* rather large, tepals white-rose; *wings* apically more or less attenuate and infuscate, callous-thickened; *labellum* broad-ovate, serrate-dentate, densely verruculose-appendiculate.

Patagon., not rare in hills near Carren-leofú.

15. C. SPEGAZZINIANA Krnzl. & Speg.

Spikes 3–6-flowered; flowers rather large; wings apically thick, fuscate-callous, basally yellow. *Sepals* white-rose, obscurely and densely clathrate-nervose. *Labellum* yellow, slightly obtuse, entire, sparsely papillose, verrucose.

Patagon., common in mountain meadows by Carren-leofú.

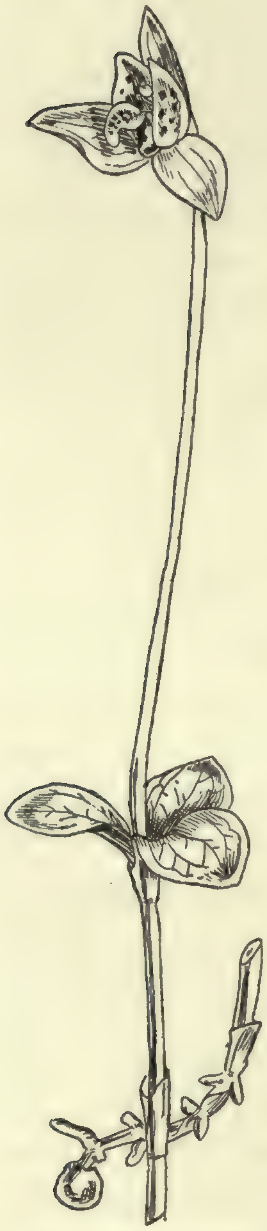
2. CODONORCHIS Lindl. (*Pogonia* Juss. p. p.)

Tuberous, with 3–6 *leaves* in a whorl about midway on a 1-flowered scape. *Petals* exceeding the sepals. *Labellum* free, spurless, sessile, or attenuate downwards, surrounding the gynandrium.

Species 2, in extra-trop. S. Amer. (Sometimes included in *Pogonia*, which has a solitary leaf on the scape.)

C. LESSONII Lindl. (*Pogonia tetraphylla* Poepp. & Endl.)

FIG. 58.



Codonorchis lessonii.

Leaves mostly 3 in the whorl, broad-ovate, petioled. *Flower* large, white, marked with purple (Fig. 58).

S. Chili, S. Patagon., at Cabo Negro and Punta Arenas (Hatcher; in flower, Jan., 1897). Fuegia. Staaten I. Falklands.

Class II. DICOTYLEDONES. Exogens.

Seeds with a dicotyledonous embryo. Flowers mostly 5- or 4-merous, occasionally 2- or 3-merous. Stem exogenous. Leaves with reticulate venation.

Including families 22–113.

Family 22. SALICACEÆ. Willow Family.

Diœcious shrubs or trees, with light, brittle wood, simple, alternate, stipulate *leaves* (the *stipules* sometimes fugacious or obsolete); *flowers* of each sex in catkins, the individual flowers in the axils of bracts, each subtended by a *disk*, but without perianth. *Male flowers* 2–many-staminate. *Female flowers* with a free 1-celled *ovary* having many erect ovules. *Seeds* plumose, without endosperm.

Species 200, in 2 genera; most in the N. Temperate and Arctic regions.

SALIX Linn.

Bracts entire. *Stamens* few, mostly 2, not exceeding 10. *Style* short; with 2 stigmas. *Leaves* mostly narrow.

Species 160; 1 each in Sumatra, S. Afr., Chili-Patagon.; a few in Mex.; the rest northwards in Eurasia and Amer.

S. HUMBOLDTIANA Willd. (*S. magellanica* Poir.)

A tree with strict vimineous branches, glabrous. *Leaves* lance-linear, attenuate, denticulate, exstipulate. *Catkins* on leafy branches, stalked, dense. *Capsules* ovate-conical, long-pedunculate. *Stigmas* sessile.

N. Patagon. Mouth of Rio Chubut. (Dusén.)

Family 23. FAGACEÆ. Beech Family (with oak, etc.).

Monœcious trees or shrubs, with alternate, simple, petioled, mostly serrate, pinnately nerved *leaves*, the *stipules*, if any, deciduous. *Flowers* small, the *males* in cylindrical or globular catkins; the *females* 1 to several, enclosed in an involucre, whose bracts form a burr or cup for the fruit. *Perianth* single, 4–8-lobed. Stamens as many, or more. *Ovary* superior, 3–7-celled; *ovules* few; only 1 in the nut.

Species 375, widely distributed. The subfamily of beeches differs from the oaks and chestnuts by having the male flowers in globular axillary clusters and the nut 3-angled, mostly with folded cotyledons. The Antarctic beeches (*Nothofagus*, often called "birches" because of their small leaves), differ from the common or northern beeches (*Fagus*) thus:

Fagus. Male clusters stalked, many-flowered. Female flowers 2. Styles long.

Nothofagus. Male flowers solitary or in threes, in short axillary cymes. Female flowers 2 or 4. Styles short. Scales of the 4- (or 2)-parted cupule folding separately.

NOTHOFAGUS Blume.

Style small; *stigma* capitate. *Leaves* usually 2-ranked.

Species 12; in Antarctic S. Amer.; 4 in N. Zeal.; *N. cunninghami* forming groves in S. Australia and Tasmania. Also fossil.

Of the Patagonian and Chilian forms some are evergreen with flat leaves, others have deciduous leaves plicate along the lateral nerves.

KEY TO THE SPECIES.

- *A.* Young leaves folded along the lateral nerves. Deciduous.
  - *b.* Female flowers in 3's, enclosed by a 4-merous fruit-cup.
    - *c.* Leaf-blades 2–5 cm. long, undulate, bluish-green on under surface. Lobes of fruit-cup with short, flat, green dorsal processes. *N. obliqua.*
    - *c2.* Leaf-blades of non-flowering or fruiting shoots 10–12 cm. long, not undulate. Lobes of the fruit-cup with long, leafy, pinnatifid, green appendages. *N. procera.*
    - *c3.* Leaf-blades 2–2.5 cm. long, somewhat wavy and lobed. Lobes of fruit cup with 3–4 horizontal, short red processes, incised on apical margin. *N. antarctica.*
    - *c4.* Leaf-blade 2–2.5 cm. long, very reticulate. Lobes of fruit-cup not appendaged. *N. montagnei.*
  - *b2.* Female flowers solitary. Fruit-cup with 2 small lobes. Narrow. *N. pumilio.*
- *A2.* Young leaves flat. Leaves persisting; trees evergreen.
  - *b.* Leaf-blade lanceolate, dark-green. Male flowers in 3's. *N. dombeyi.*
  - *b2.* Leaf-blades ovate-elliptical, dark-green, glandular underneath. Male flowers solitary. *N. betuloides.*
  - *b3.* Leaves trapezoid-ovate, yellow-green. Male flowers in 3's. *N. nitida.*
- *A3.* Of doubtful place and character. *N. alpina.*

(I) *Leaves* plicate along the lateral nerves, deciduous.

1. N. ANTARCTICA (Forst. sub *Fagus*) Blume. (*Fagus alpina* Poepp. of DC. Prodr., non Poepp. & Endl.)

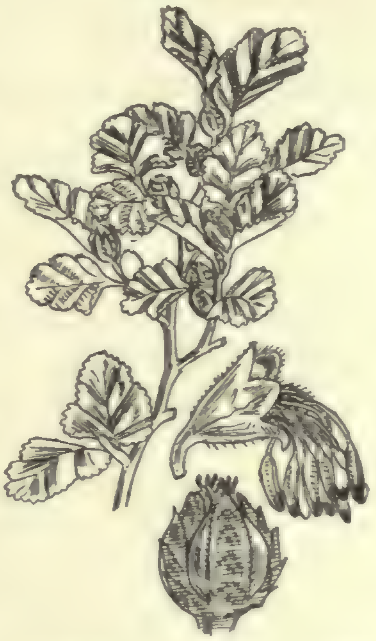
Leaves deciduous, plicate in vernation, ovate or elliptical, obtuse, somewhat obliquely truncate at base, bidentate or bicrenate, the lateral nerves tending to the sinuses, glabrescent above, pubescent at margin and on petiole underneath. *Male perianth* funnelform, obtusely lobed. *Anthers* slightly exserted, long, mucronulate. *Fruit* ovoid, its scales 1-seriate, rounded, ciliate. *Nucules* puberulous (Fig. 59).

S. Chili, and S. Patagon., and through Fuegia to Cape Horn. In Cordilleras of S. Patagon. "the most abundant tree." (J. B. Hatcher. Fruiting March 8); Staaten I.

Both kinds of flowers are on adjacent branches. "Bark rough, fruit small." (R. O. Cunningham.)

The varieties are numerous.

FIG. 59.



Nothofagus antarctica. Flowering branch with leaves, staminate flower and fruit. (After *Flora antarctica.*)

NOTHOFAGUS ANTARCTICA BICRENATA (*N. pumilio*, O. Ktze.). N. ANTARCTICA LATIFOLIA F. Kurtz.

Leaves membranous, glabrous, orbiculate-ovate, lobed, acutely toothed, lateral nerves 3–4, prominent underneath.

Beagle Channel, Navarin I.

N. ANTARCTICA PALUSTRIS Alboff.

Shrub, over 1 meter high, the younger branches pubescent. *Leaves* small, ovate, coriaceous, shining above, pale underneath, glabrous, glandulous margin crisp, crenulate, the teeth thick-margined, reticulately venous, with the 3–4 lateral nerves prominent underneath. Near *N. antarctica uliginosa*.

Navarin I. and Olivaia, in bogs.

N. ANTARCTICA SUBALPINA Alboff.

As *N. antarctica palustris*, but the *leaves* larger (2 cm. by 18 mm.), more glabrous and subduplicately crenulate.

Beagle Channel, subalpine above Ushuaia, where it forms impenetrable thickets, low and twisted intricately like a wall.

N. ANTARCTICA SUBLOBATA.

Leaves undulate, few-lobed, and frequently dentate-crenate.

Patagon.; Fuegia, near Cape Horn. (Plate XIV.)

NOTHOFAGUS ANTARCTICA ULIGINOSA DC. (*Fagus uliginosa* Phil.)

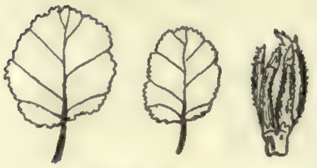
Leaves undulate-margined, frequently crenulate-toothed; on both sides, especially on the nerves beneath and on the petioles, finely pubescent with minute, erect *hairs.*

(Chili); Patagon. In swamps, often as a shrub with small leaves. Nerves 4–5 on both sides. Chubut, in Andine woods.

2. N. MONTAGNEI (Humb. & Jacq.) Reiche.

Older *branches* cinereous, younger purple, these with short, golden *hairs* on one side. *Leaves* shortly-petioled, ovate, obtuse, basi-truncate, coriaceous, shining, pale underneath, very reticulate, 4–5-lobed and crenate. Lateral *nerves* 3–4 on each side. *Involucral lobes* 4, oblong, scarcely appendaged. *Nutlets* winged, 3 in each involucre, not ciliate. Leaves smaller than in *N. antarctica* (Fig. 60).

FIG. 60.



Nothofagus montagnei. Leaves and (to right) involucre. (After Dusén.)

Chonos Archip.

3. N. OBLIQUA (Mirb.).

Leaves deciduous, plicate in vernation, elliptical or ovate, obtuse, irregularly biserrate, the base entire, pilose on the nerves, 18–36 mm. long and half as broad, the teeth varying in the same leaf. *Male perianth* sinuately lobed, *anthers* longer than the filaments. *Fruit* ovoid, its scales ovate-lanceolate, not spreading.

Chili to Magellan, replacing *N. antarctica* in Chili, and reaching the sea-level at Magellan. Native name "Roble."

4. N. PROCERA (Poepp. & Endl.).

Leaves oblong, more rounded at base than at apex, shortly and hirtly petiolate, rather large to 10 cm. long, biserrate with 3–4 rather large denticulate crenæ, glabrous on upper, pubescent on under surface, margin ciliate. Flower? Fruit? Lofty tree. "Rauli."

(Chili); Patagonia?

5. P. PUMILIO (Poepp. & Endl.) Blume.

Perhaps a variety of *N. antarctica* with *leaves* regularly bicrenate, or more closely and deeply serrate, and pubescent on both surfaces. "Species most distinct from *N. antarctica.*" (Speg.)

Patagon.; S. Fuegia (Dusén); S. Patagon., by Hatcher. (Hatcher's specimen bore the moss *Dicranum cirrhifolium* C. Muell.) W. Patagon. "forming groves by the river Aysen, up to an elevation of 1,000 meters, and up to 1,300 meters as mere shrubs growing in thickets." (Dusén.)

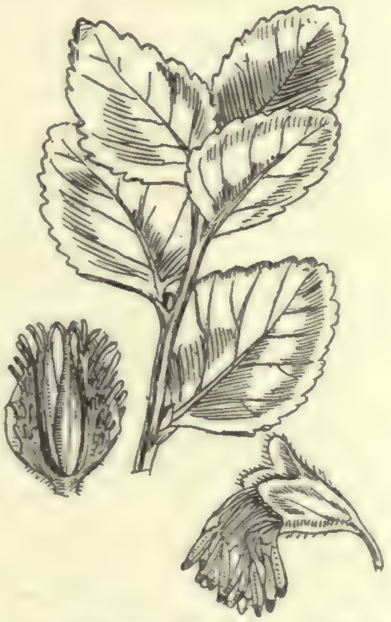
(II) *Leaves* not plicate, mostly *evergreen.*

6. NOTHOFAGUS BETULOIDES (Mirb.) Blume.

Leaves plane, ovate or elliptical, obtuse or subacute, their base unequally acute or obtuse, coriaceous, evergreen, crenate-serrate, glabrous, short-petiolate, glandulous-punctate underneath. *Male flowers* solitary, very short-pediceled, perianth broad-funnelform, obtusely 4–7-lobed, *anthers* callously mucronulate. *Fruits* solitary, axillary, lobes of the 4-partite *involucre* oblong with erect filiform segments as long as the nucules (Fig. 61).

South Chili and S. Patagon., through Fuegia to Cape Horn, very abundant; the common evergreen beech of Fuegia. Fuegian name, "Ouchpaya." The coasts of West Magellan are covered by this and *Drimys winteri.* (Dusén.) By Hatcher in the Cordilleras of S. Patagon., bearing the parasitical *Myzodendron punctulatum.* Feb. 18. "Bark smooth, gray." Staaten I.; West Patagon. at a high elevation. (Dusén.)

FIG. 61.



Nothofagus betuloides. — Leafage: staminate flower (on right), and pistillate flower (on left). (After *Flora antarctica.*)

7. N. DOMBEYI (Mirb.) Oerst.

Leaves plane, evergreen, elliptical-ovate or oblong, acute or obtuse both ways, coriaceous, serrate, glabrous, short-petiolate. *Staminal clusters* much shorter than the leaves. *Fruits* solitary, axillary; the lobes of the 4-partite *involucre* oblong, 2–3-laciniate, shorter than the nuts.

South Chili, valuable wood, "coique." Patagon., Chubut; in Præandine woods near Rio Carren-Leofú.

8. N. NITIDA Phil.

Branchlets cinereous, the season's with dense, short, golden hairs, appressed upwards. *Leaves* short-petiolate, most ovate-lanceolate, coriaceous, very shining, serrate, glabrous, the young gold-hairy on petiole and nerves. *Involucre* of the female flowers sessile, the young with scarious scales, enclosing *five* obtusely trigonal nutlets. Male flowers?

S. Chili; Patagon. "Coihue" and "Roble." Except *Cipres* (*Libocedrus*) it constitutes almost exclusively the forests of Guaitecas and Chonos.

(III) "Of doubtful place." (Reiche.)

9. NOTHOFAGUS ALPINA (Poepp. & Endl. sub *Fagus*).

Leaves ovate-lanceolate, basally rotundate, serrulate, rough on both sides, ciliate, glutinous above. *Involucral* lobes ovate, dorsally and marginally appendiculate; the appendages incised or multifid, glandular.

(S. Chili); Patagonia.

(Not *Fagus alpina* Poepp., of DC. Prodr., which is *F. antarctica* Forst.)

Dusén gives the following species of Fagaceæ as occurring in a fossil condition in Fuegia or Patagonia:

Fagus dicksoni Dus., at Barancas de Carmen Sylva, Fuegia.

F. integrifolia Dus., at Barancas de Carmen Sylva, Fuegia.

F. subferruginea Dus., at Barancas de Carmen Sylva and at Punta Arenas.

Nothofagus australis Dus., at Barancas, Rio Condor and Rio Guillermo.

N. crenulata Dus., at Rio Guillermo.

N. densi-nervosa Dus., at Barancas, Rio Condor and Rio Beta.

N. elongata Dus., Barancas.

N. lanceolata Dus., at Barancas, Rio Guillermo, Punta Arenas.

N. magellanica Engelh., Barancas.

N. cfr. *obliqua* Mirb., Conception.

N. serrulata Dus., Barancas and Punta Arenas.

N. simplicidens Dus., at Barancas, Rio Condor, Punta Arenas.

N. variabilis Dus.

Family 24. URTICACEÆ. Nettle Family.

Usually herbs with watery sap, simple, alternate or opposite *leaves*, mostly stipulate, and often with stinging *hairs;* and clusters of small, sexually distinct, apetalous *flowers*. *Calyx* 2–5-parted, *stamens* as many, opposite its lobes. *Filaments* reflexed and anthers reversed in the bud.

Ovary free, 1-celled; *style* 1, undivided; ovule 1. *Fruit* an achene, with scanty *endosperm*.

Species 1,500, in warm and temperate countries.

KEY TO THE GENERA.

A. Perianth consisting of 2–5 distinct leaves. Foliage-leaves opposite.

1. Stinging. Flowers 4-merous. Achene enclosed in one of the two larger sepals. *Urtica.*

2. Not stinging, smooth and shining. Flowers mostly 3-merous; their sepals unequal, all, or all but one, small. Achenes partly naked. Leaves of a pair unequal. *Adicea* (*Pilea*).

A2. Perianth symphyllous, tubular or campanulate in the fertile flowers. Plants not stinging. *Parietaria.*

1. URTICA Linn. Nettle.

Leaves opposite, petiolate, serrate or incised, with stinging hairs, and distinct or connate stipules. *Flowers* 4-merous, in axillary clusters, diœcious or monœcious or androgynous. *Achenes* compressed, enclosed in the persisting *calyx*.

Species 30, widely dispersed extratropically.

1. U. DARWINII Hook. f.

Stem slender, erect, sparsely pilose, or even glabrous. *Leaves* membranaceous, ovate-acuminate, coarsely crenate-serrate, rounded at base, 3-nerved, finely punctate, puberulous; petiole slender; *stipules* linear-oblong, subacute. *Flowers* glomerate, in slender, setose, interrupted *spikes* longer than the petiole. (Larger flowers and achenes than *U. dioica*.)

Chonos Archip.

2. U. DIOICA Linn.

Root perennial. *Stem* erect, the whole plant stinging or smooth. *Leaves* ovate-acuminate to ovate-lanceolate, serrate, cordate or rounded at base; *stipules* in pairs between the petioles. *Spikes* in pairs, mostly diœcious, much branched, exceeding the petiole, pendulous in fruit.

(N. Temperate zone, fig. in Brit. & Br. i, 531); Magellan. (Dusén.)

3. U. MAGELLANICA Poir.

Stem stout, erect, hispid. *Leaves* subcoriaceous, rugose, ovate to ovate-lanceolate, acuminate, basicordate, acutely serrate-dentate, setose on both sides; stipules linear-oblong, acute. *Glomerules* setose, in interrupted spikes, shorter than the petioles or longer.

S. and W. Patagonia; Magellan. Fuegia to Cape Horn.

("One of Anson's ships had its crew cured of scurvy by nettle-tops at the west part of Magellan Strait; 1742.")

4. URTICA SPATULATA Smith.

Stem erect or ascending, to 30 cm. high. Glabrous between the stinging hairs. *Leaves* small, rotundate, basi-cuneate, incised, with lanceolate, acute teeth; petiole exceeding the limb; *stipules* interpetiolar. *Clusters* crowded, shorter than the petioles. The larger segments of the fruiting *calyx* unarmed.

S. Brazil; common about Bahia Blanca, and probably in N. Patagon.

5. U. URENS Linn.

Annual. *Stem* stout, 40 cm. tall, stinging-bristly, leafy to the top. *Leaves* thin, nearly glabrous, elliptic-ovate, deeply incised or biserrate, 3–5-nerved, all slender-petioled. *Spikes* in pairs, oblong, subsimple, shorter than the petioles. *Achenes* granulate.

(Eur., nat. in N. Amer., fig. in Brit. & Br. i, 532.)

N. Patagon., in cultivated places near Carmen de Patagones. Magellan, introd.; Fuegia, at Ushuaia, rare.

2. ADICEA Raf. (1815). (*Pilea* Lindl, 1821). Clearweed.

Monœcious or diœcious, with axillary *cymes* and not stinging. *Male flowers* 4-merous, rarely 2–3-merous, with rudimentary ovary; *female flowers* unequally 3-merous, with staminal rudiments. *Leaves* opposite, *stipules* connate into a single interpetiolar stipule. *Bracts* small, rarely a few larger.

Species 150, most in trop. Amer.

A. ELLIPTICA (Hook. f. sub *Pilea*).

Stem low, sparsely branching. *Leaves* long-stalked, membranaceous, elliptical, subobtuse, coarsely crenate-serrate, 3-nerved; pubescence minute-appressed (due to raphides). *Male flowers* in a long-stalked, capitate umbel; *female flowers* glomerate, sessile. *Achene* orbicular, compressed, obliquely emarginate.

Chonos Archip.

3. PARIETARIA Linn.

Herbs, mostly diffuse, with 3–8-flowered, androgynous, axillary *cymules* of 4, rarely 3-merous *flowers*. *Leaves* alternate, entire, 3-nerved, exstipulate. *Fertile flowers* sometimes hermaphrodite, with a tubular or campanulate, 4-lobed calyx, free from the involucral bracts. *Stigma* short or linear, tufted.

Species 8, chiefly in temperate regions of both hemispheres.

P. DEBILIS G. Forster.

Annual, with erect or diffuse *stem*, and ovate, or rhomboid, or subrotund *leaves*. *Cymes* few-flowered. *Bracts* linear or lanceolate, scarcely enlarged in fruit.

(Subtropical) ; Chubut, in cultivated fields.

Family 25. PROTEACEÆ.

Shrubs or trees, rarely perennial herbs; with exstipulate leaves, and 4-merous flowers with single symphyllous, hypogynous *perianth;* the 4 *stamens* inserted on and included in the perianth. *Ovary* 1-celled, with terminal style. *Seeds* mostly 1–few, without endosperm.

Species 1,000, most in Austral. and S. Africa; few in the Orient and S. Pacific Is. and S. Amer.

("All the American species belong to the section having flowers in pairs, enclosed by the bract." R. Brown, 1811.)

KEY TO THE GENERA.

A. Leaves simple. Perianth-tube cleft behind. Seeds usually more than 4.

b. Shrub with terminal racemes of red flowers. Capsule long, leathery or almost woody. A ring-formed hypogynous disk. 1. *Embothrium.*

b2. Trees or shrubs with axillary or terminal racemes. Capsule leathery, broad and flat. Hypogynous disk represented by 3 broad, truncated, glandular processes. 2. *Tricondylus* (*Lomatia*).

A2. Trees with alternate, pinnate leaves, and axillary racemes of white flowers, having cylindraceous perianth-tube, the segments separating from the base. Hypogynous disk a fleshy, 2-lobed half-ring. Seeds 2, rarely 4, becoming coral-red "hazel-nuts." 3. *Guevina.*

1. EMBOTHRIUM Forst.

Evergreen shrubs, with sparse, coriaceous, entire *leaves*, and dense, terminal *racemes* of geminately pediceled red *flowers*, with none or a few minute *bracts*, and a semiannular, fleshy, hypogynous *disk*. *Perianth-tube* cylindrical, cleft behind. *Ovules* many, becoming samaroid.

Species 4, in Extratropical S. Amer.

1. EMBOTHRIUM COCCINEUM Forst.

Leaves subsessile, oval, obtuse, attenuate basewards, underneath opaque-pale, and veinless; veiny and shiny above. *Pedicels* shorter than the calyx, and *style* as long, its apex fusiform.

Handsome; fig. in Eng. & Prantl, iii, 1, p. 123, C., & p. 149, A–D.

S. and W. Patagon., by Lago Argentino, Cabo Negro, Magellan; Fuegia to Cape Horn; at Lago Nahuel-huapi. (Dusén.)

E. COCCINEUM OBLANCEOLATUM O. Ktze.

Leaves of floriferous branches oblanceolate, rather obtuse, broad above.

(Chili); Patagon.

E. COCCINEUM OBOVATUM O. Ktze.

Leaves short, obovate, 1–3 cm. broad, rather obtuse.

(Chili); Patagon.

2. E. LANCEOLATUM R. & P.

Leaves short-petioled, oval-oblong, lanceolate, or narrower, obtuse, mucronulate, attenuate basewards or both ways, discolored, opaque or shining above, 1-nerved, nearly veinless. *Pedicels* as long as the calyx, 25 mm.; stigma oblong-fusiform, smooth.

(S. Chili); Chubut, in shrubberies by the hills.

2. TRICONDYLUS Kn. & Salisb. (*Lomatia* Br.).

Trees or shrubs, with *racemes* of geminately pediceled flowers. *Perianth-tube* oblique, cleft behind. Hypogynous *glands* 3. *Stigma* on a lateral disk. *Ovules* many, becoming samaroid.

Species 9, Chili, E. Austral. and Tasmania.

1. T. DENTATUS (R. & P.) O. Ktze.

Leaves oval, serrate-dentate, glabrous as the *petals*. *Racemes* lateral, abbreviate. *Calyx* pilose. *Ovary* tomentose.

(Chili); Patagon.

2. TRICONDYLUS FERRUGINEUS (Br.).

Leaves most opposite or whorled, bipinnatifid, woolly when young. *Perianth* short, dilated below. *Seed* sometimes winged, as in other Chilian species, sometimes wingless as in Australian species.

(S. Chili); Chonos Archipel.; Magellan. (R. O. Cunningham.)

Near Lago Nahuel-huapi.

3. T. OBLIQUUS (R. & P.) O. Ktze.

Leaves ovate, serrate, glabrous. *Racemes* axillary, the *pedicels* and *calyx* pilose. *Stigma* deciduous.

(Chili); Patagon., Chubut.

T. OBLIQUUS ALNIFOLIUS (Poepp.).

Leaves densely toothed, the teeth often rather acute. *Racemes* generally shorter than the leaves.

(Chili); Chubut, in mountain groves.

3. GUEVINA Molina.

A tree, with unequally pinnate *leaves*, having toothed leaflets. *Flowers* paired, pediceled, in long, axillary racemes. *Bracts* minute, caducous, or none. *Perianth-limb* recurved; anthers subsessile on the lobes. *Ovules* 2, rarely 4, collateral. *Drupe* 1-seeded, size of a cherry, coral-red, edible, " Chilian hazel-nut."

Species only 1, viz:

G. AVELLANA Molina.

Leaflets 2–5 pairs, short-petioled or sessile, ovate or cuneate-obovate or subrotund, 3–10 cm. long. *Racemes* dense-flowered, tomentose.

(Chili); W. Patagon.

Family 26. LORANTHACEÆ. Mistletoe Family.

Green parasites on woody plants. *Leaves* mostly opposite. *Flowers* either perfect or diœcious or monœcious, with single or double, regular perianth. *Perianth-tube* adnate to ovary. *Stamens* 2–6, epiphyllous. *Ovary* 1-carpellary, 1-seeded. *Style* 1 or none; *fruit* a berry. *Endosperm* large.

6. MYZODENDRON PUNCTULATUM (Banks) Sol.

Leafless; the branches with projecting disks depressed in their center. *Staminal* flowers in catkins; *stamens* 2. *Achenes* 4 mm. long; *plumes* about 10 times as long.

Common everywhere in Patagon. By Hatcher on *Nothofagus betuloides* Mirb. at Punta Arenas; in fruit Feb. 18, 1897. Fuegia, *passim*, on *Nothofagus antarctica*. Staaten I. (Plate XIV.)

7. M. QUADRIFLORUM DC.

Leaves small, broad, obtuse. *Flowering* branches long, bearing 1-leaved branchlets, alternating; each branchlet 3–5-flowered. *Achenes* linear; *plumes* slender, with brown, naked top.

S. Patagon., Magellan; Staaten I.; S. Fuegia, Ushuaia, Navarino (rather rare).

8. M. RIOQUINOËNSE O. Ktze.

Leafless, 20 cm. long, much branching, all brownish-yellow. *Branches* terete, suberect, everywhere punctulate-warty. *Spikes* sessile, dense, 10-flowered, scarcely 1 cm. long. *Bracts* cup-like, very remote in the upper, sterile branches. *Setæ* 3, 3 times exceeding the fruit; barbate-pilose, the hairs one third as long as the seta. *Ovary* cylindrical; *stigma* sessile, conical, scarcely 3-lobed. Male plant unknown. Parasite on Beech.

(Chili); Chubut, woods along Carren-leofú, and by Rio Aysen in W. Patagon.

Family 28. SANTALACEÆ. Sandalwood Family.

Mostly herbs or shrubs, with entire, exstipulate *leaves* and greenish, apetalous *flowers*, perfect or diclinous. *Calyx* adnate to the ovary, 5–6 lobed, bearing as many *stamens*. *Ovary* 1-locular; ovules 2–3, pendulous; *style* simple. *Drupe* or nut, having 1 seed, with large *endosperm*.

Species 250, chiefly tropical.

KEY TO THE GENERA.

A. Tube of the more or less epigynous perianth not produced above the ovary, or produced and then covered by the disk. Fruits drupaceous.

- *b.* Disk entire, or only ventricose-lobed.
  - *c.* Flowers 4-merous, in 1–3's, subsessile among the uppermost leaves. Perianth-leaves free to the disk. Low herb, with linear leaves. 1. *Nanodea.*

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J. B. HATCHER IN CHARGE

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VOLUME VIII

BOTANY

PART V, FLORA PATAGONICA. SECTION 2
SANTALACEÆ-CACTACEÆ

BY

GEORGE MACLOSKIE

PRINCETON UNIVERSITY

(Pp. 339-594. Pl. XV-XX)

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c2. Flowers 5-merous, in sessile, quasi-catkins at the defoliated nodes. Perianth-leaves distinct to the ovary. Shrub with small, plane leaves. Fruit pea-like. 2. *Myoschilos.*

b2. Disk produced to interstaminal lobes. Axillary, sessile fascicles of 4–5-merous flowers. Shrub having rhomboid leaves with spinescent angles. 3. *Iodina.*

A2. Tube of the perigynous perianth more or less produced above the ovary, and not covered by the disk. Spikes terminal. Fruits nutlets.

b. Low herbs with linear or sublanceolate, rather rigid leaves. Flowers 4–5-merous. Bracts and bractlets not coalescing. 4. *Arjona.*

b2. Low herbs with linear leaves. Bracts and bractlets coalescing into a calyculus below the mostly 5-merous flowers. 5. *Quinchamalium.*

1. NANODEA Banks.

Low, moss-like, with alternate, narrow-linear *leaves*, concealing the perfect, subsessile *flowers*, which are mostly solitary. *Calyx* not produced above the ovary. *Disk* concave. Fruit a drupe.

Species 1, viz.:

N. MUSCOSA Gaertn. f.

Stem 6 cm. high. Upper *leaves* 8–16 mm. long. *Flowers* violet, 3 mm. long.

Magellan, in damp meadows; S. Fuegia (Dusén); Staaten I.; Falklands.

2. MYOSCHILOS Ruiz & Pav.

Branching, glabrous shrub, with small alternate, entire *leaves*, and catkin-like *spikes* at the leafless nodes of last year's branches. *Flowers* hermaphrodite, severally subtended by *bracts;* calyx-lobes 5, glabrous, their bases bearing 5 short *stamens* with small *anthers*. *Disk* broad; *style* 3-lobed. *Ovules* 3, pendulous. *Fruit* a drupe, sometimes with persisting bracts and calyx-lobes.

Species 1, viz.:

M. OBLONGUS Ruiz & Pav.

Leaves ovate, mucronulate, 12–25 mm. long, shortly petioled. *Spikes* 4–6 mm., ovoid, *flowers* purplish. *Calyx-lobes* transversely sulcate. *Drupe* purple, pea-like.

S. Patagon., upper valley of Rio Gallegos. (O. Nordenskjöld.) (Chili and Peru.) An infusion of its leaves is used for senna. "Codo-coypu"; food of the coypu rodent (*Myocastor coypus*).

MYOSCHILOS OBLONGUS ANGUSTUS (Phil.). *Leaves* narrow-linear. Patagonia (?).

3. IODINA. Hook. & Arn.

Tall, glabrous shrub, with alternate, rhombic, spinescent-angled, coriaceous *leaves*, and sessile, axillary *cymes* of 5-merous, puberulent *flowers*. *Calyx* with its free part broad-campanulate. *Style* conical, 3-cleft. *Ovules* pendulous on a central placenta. Globose *drupe*, separating into segments.

Species 1, viz.:

I. RHOMBIFOLIA Hook. & Arn.

(S. Brazil; Argentina); N. Patagon., in small groves at wide intervals over the dry ground. Fig. in Eng. & Prantl, iii, 1, p. 223. Called by the Spaniards "Sambretoro," a name also applied to *Maytenus;* by the Araucarians "Trallian."

4. ARJONA Cav.

Low herbs, often with tuberiferous rootlets, with alternate, linear or lanceolate, rigid, acute, glabrous *leaves*, often recurved; and pubescent *flowers* in a terminal *spike*, with bract and free bractlets. *Calyx-tube* continuing above the ovary; the 5 lobes recurved, spreading. *Stamens* included; anthers linear-oblong. Annular *disk* distinct from calyx. *Fruit* nut-like, enclosed in bracts and bractlets.

Species 9, in Chili and Patagon.

KEY TO THE SPECIES.

A. Leaves narrow-linear, 1-nerved, glabrous. Perianth silky outside. Racemes few-flowered.	
b. Leaves soft, green, apex mucronate. Perianth glabrous inside.	*ameghinoi.*
b2. Leaves flaccid. Perianth tufted inside.	*pusilla.*
A2. Leaves lanceolate, 3-nerved, woolly.	*adpressa.*
A3. Leaves long-linear, nervose, glabrous. Stem striate, apically naked and villous.	*longifolia.*
A4. Leaves linear-lanceolate, 5-nerved, largest upwards, amplexicaul.	*rigida.*
A5. Leaves ovate, 7-nerved, upwards lanceolate and 5-nerved.	
b. Leaves shorter, with rigid points, deficient downwards.	*patagonica.*
b2. Leaves longer, smooth or hairy, to woolly.	*tuberosa.*

1. A. AMEGHINOI Speg.

Soft, green, glabrous, perennial herb. *Leaves* alternate, narrow-linear, 1-nerved, apex minutely and acutely callose-mucronate. *Racemes* very depauperate, 1–5-flowered, relaxed. *Bracts* ovate-cochleate, green, glabrous, except the apex. *Perigonium* 5 times exceeding the bracts, outside appressed villous-silky, inside glabrous.

S. Patagon., in wet places by Rio Chico, at Chonk-aike.

2. ARJONA ADPRESSA Phil.

Densely arachnoid *woolly*. *Leaves* lanceolate, 3-nerved, the lower distant, subreflexed, the upper appressed, mostly imbricate. Flowers? *Tubercles* edible.

W. Patagon., along Rio Aysen, in rocky mountain meadows.

3. A. LONGIFOLIA Phil.

Stem sulcate-striate, its apex naked, villous. *Leaves* rigid, rather distant, long-linear, nervous, glabrous. *Perigonial* tube 12 mm. long, twice as long as the ovate, short bract.

(Mendoza); Chubut, in hills near Rio Carren-leofú.

4. A. PATAGONICA Homb. & Jacq. (*A. tuberosa* v. *patagonica* DC.)

Strict, erect, simply branching. Lowest *leaves* ovate, 7-nerved; the others lanceolate, 5-nerved; all with a rigid point. *Perianth* pilose inside, with pencils; lobes apically callous, glabrous inside. *Bracts* half shorter than the perianth-tube. Leaves shorter than in *A. tuberosa*, deficient downwards.

(Bahia Blanca); N. Patagon.; Punta Arenas; Fuegia; S. Patagon. (at Rio Coy, J. B. Hatcher, Dec. 30, 1896. "No tuberosity on roots." None should be expected at the date.). Spanish name "Macachina." Araucanian, "Sakel." "In winter one or more tubers are developed; these are eaten, raw or cooked. Southwards this is replaced by a different species with larger and thinner tubers." (Claraz per J. Ball.)

5. A. PUSILLA Hook. f.

Stem slender, erect, simple or divided. *Leaves* flaccid, generally recurved, long-linear, acuminate, the margins glabrous, 1-nerved. *Flowers* few, the outer bract large, cymbiform, obtuse, glabrate; the *calyx* externally silky, its throat enlarged between the stamens, with fascicles of jointed hairs. *Stigmas* 3, small.

S. Patagon., at Killik Aike, and Rio Coy (J. B. Hatcher, Dec. 13. "White to purplish.") Magellan, E., N. and S. Fuegia (Dusén); by Rio Chubut.

6. ARJONA RIGIDA Miers. (*A. tuberosa* Phil. non Cav.)

Low undershrub, 7 cm. high, with slender, striate, glabrous *stems* *Leaves* smaller and sparse below, larger and denser above, linear-lanceolate, canaliculate, amplexicaul, cuspidate-pungent, 5-nerved, margin cartilaginous, divaricate, glabrous. *Inflorescence* terminal, with a short silky peduncle, sessile flowers, and ovate-lanceolate, villous calycle. *Bracts* 2, laterally opposite, concealed by the calyculus, oblong, snowy-tomentose. *Perigonium* orange, retrorsely villous on outside. *Tube* slender; segments oblong, acute, glabrous inside. Filaments short; *anthers* included. *Ovary* 5-angular. *Style* filiform, 3-branched.

(Argentina to Mendoza); probably in N. Patagon.

7. A. TUBEROSA Cav.

Herb from a woody base, 12 cm. high; branches glabrescent. *Leaves* smooth or hairy, the lowest ovate-acute, 7-nerved; the others lanceolate, 5-nerved. *Bracts* and *bractlets* ovate-acute, hairy outside. *Perianth-tube* cylindrical, funnelform upwards, pilose or silky.

S. Patagon., Valley of Rio Gallegos (Nordenskj.); Magellan; Rio Sta. Cruz (Hatcher); Puerto Deseado; N. and E. Chili; Golfo de San Jorge (Mts. of Chili).

A. TUBEROSA LANATA n. var. (Plate XVI.)

"Apparently a woolly variety of *A. tuberosa* Cav., from which it differs very slightly in the flower." (Royal Gardens, Kew.)

By J. B. Hatcher in S. Patagon.

5. QUINCHAMALIUM Juss.

Low, glabrous herbs, with alternate, very narrow *leaves* and terminal *spikes* or heads of flowers, with a depressed, cup-like *calycle*, having a lacerate margin. *Calyx* globose, 4–5-costæ, ending in as many teeth, one of these slightly enlarged. *Corolla* tubular, its throat enlarged and bearing the slightly exserted, ovate-cordate *anthers*, which are opposite the acutely oblong, subrecurved corolla-lobes. *Style* filiform with 3 small *stigmas*. *Ovary* ovoid-globose, 1-celled, with 3 ovules. *Nut* 1-seeded within the persistent calyx.

Species 20, in the Andes; the expressed juice is used medicinally as a drink.

(J. Miers would place *Arjona*, *Myoschilos* and *Quinchamalium* in *Olacaceæ,* because they have a double perianth. Journ. Linn. Soc. Bot., xvii, p. 138.)

1. QUINCHAMALIUM CHILENSE Molina. "Quinchamali."

Annual, with stout fistular *stem*, 12 cm. high, the branches all reaching nearly the same height. *Leaves* diverging and curving upwards, linear-lanceolate, acute at both ends, margin subrevolute, 1-nerved on short petioles. Peduncle 4-angled. *Flowers* 5-merous, numerous in terminal globular *heads.*

(Chili); Patagon. Figs. G–P in Eng. & Prantl, iii, 1, p. 226.

Q. CHILENSE PROCUMBENS.

2. Q. GRACILE Brongn.

Very slender, with a flexuous, fibrilliferous *root*, and erect, slender *stems*, about 5–8 cm. high. *Leaves* linear, subfalcate, mucronate on a short petiole. *Head* of small, orange flowers. *Corolla* divided half way into 5 narrow segments. *Fruit* small, 5-costate, lemon-colored, in the calyx.

Patagon., by Rio Chubut; Lago Blanco; Rio Senger.

3. Q. MAJUS Brongn.

Stems erect, 25 cm. high, apically branching. *Leaves* linear, acute, 12–25 mm. long, sparse, the uppermost scabrous-margined. *Involucel* glabrous; flowers rather large; *perigonium* 15 mm. long, yellow-orange.

Q. MAJUS SPEGAZZINII (Speg. var. sine nomine).

Fructiferous *stems* thickening from the base gradually to the apex.

Patagon., by Rio Chubut.

4. Q. PATAGONICUM F. Phil.

Perennial. *Stems* ascending, striate, slender. *Leaves* fleshy, linear, apiculate. Segments of *perianth* two thirds as long as the 10 mm. tube. *Stamens* with very short filaments, and anthers one third or one half as long as the perianth-segments, slender. *Style* shorter than the anthers. *Fruit* inclosed in the subglobose, crustaceous, free, toothed involucre.

W. Patagon., in the Cordilleras. Stem 11 cm. long. Flowers 15–20 in a dense capitate spike. Larger leaves 12 by 1 mm. Like *Q. andinum*

Ph. and *Q. linarioides* Ph., but distinguished by its free crustaceous calyx enclosing the fruit.

Family 29. OLACACEÆ.

Trees or shrubs with mostly alternate, simple, entire exstipulate *leaves*, and perfect, regular, 4–6-merous *flowers*, having a double *perianth*, the outer being small, cup-like, adnate to the hypogynous disk. Inner perianth-leaves distinct or united, and bearing 1–3 (mostly 2) times as many *stamens*. *Ovary* 1-celled, rarely partially 2–4-celled; the cells mostly with 1 pendulous *ovule*. *Fruit* a 1-seeded drupe or nut, with large *endosperm* and no testa.

Species 140, tropical. Two genera occur only in S. Amer. and W. Afr., one, *Heisteria*, with 20 sp. in S. Amer. and 1 sp. in Afr., the other *Ptychopetalum*, with 2 sp. in W. Afr. and 1 in Guiana and N. Brazil. It is uncertain whether the outer floral cup is a true calyx, or an involucre.

XIMENIA Plum.

Flowers 4-merous; inner *perianth* of 4 (rarely 5) linear, white leaves, hairy inside, apically revolute. *Stamens* 8–10. *Ovary* long-conical, 4-celled, 4-ovuled. *Drupe* ovoid, globular. Often with thorny branches.

Species 5, in S. Amer., Africa, Asia, and N. Caledon. Its hard wood is used as sandal-wood in the East Indies, and its fruit is eaten.

X. AMERICANA Linn.

Leaves oblong. *Peduncles* several-flowered, the lower often changed into spines.

(Guiana, Brazil, etc.) (Fig. in Eng. and Prantl, iii, 1, p. 237.) N. Patagon.

Family 30. HYDNORACEÆ.

Succulent, parasitical herbs, with branching, *leafless* creeping *rhizoids*, which radiate from the insertion of the nutritive root, and produce here and there large *flowers* emerging from the ground. *Flowers* hermaphrodite, with single, 3–4-lobed, regular *perianth*, and inferior *ovary*. *Stamens* sessile within the tubes, isomerous and alternating, with many anthers having linear pollen sacs. *Ovary* 1-celled, with many parietal *placentæ*, having many pendulous *seeds*. *Fruit* fleshy. *Embryo* globose, with *endosperm* and *perisperm*.

Species 8, Africa, and 3 species in extratropical S. Amer.

PROSOPANCHE DeBary.

Flowers on a leather-colored stalk, 3-merous, the 3 *stamens* surmounting 3 fleshy *staminodes* which are deeper in the tube. *Placentæ* plate-like, as 3 partitions of the ovary, enclosing the seeds.

Species 2.

1. P. BONACINAI Speg.

Tuber deeply delitescent, suborbicular or lenticular, branches solitary, long, hypogæous, 1-flowered. *Flowers* suberous-coriaceous, mostly 3-merous, with inferior, globose *ovary;* of the size of a hazel-nut, and with long, slender tube which equals or surpasses the thick apical lobes, themselves exceeding the long-ovate *staminal column*. Fruit subbaccate, small, slightly pulpy. Mostly the perianth-lobes are the only parts visible above the ground. The tubercle is buried several meters deep.

N. Patagon., by Rio Colorado, from the preandine region to the Atlantic, "Flor de tierra," parasitical on *Baccharis salicifolia*, *Gourliea decorticans* and on species of *Salicornia*. Its pulverized staminal column is used as hæmostatic, and its decoction as internal medicine.

2. P. BURMEISTERI DeBary.

(S. Amer., in pampas of Argentina, on roots of species of *Prosopis;* sometimes so common that pigs are driven to feed on the fruits.)

Family 31. POLYGONACEÆ. Buckwheat Family.

Herbs or shrubs, with jointed *stems*, and usually sheathing *stipules* (these obsolete in the *Eriogonum* section). *Flowers* small, regular, perfect or variously diclinous. Petals none. *Calyx* free, 2–6-parted, its segments sometimes petaloid. *Stamens* 2–9, hypogynous. *Ovary* 1-carpeled, 1-ovuled; *style* 2–3-cleft. *Achene* lenticular or 3-angled (or rarely 4-angled). *Embryo* orthotropous, in mealy endosperm.

Species 800, widely distributed.

KEY TO THE GENERA.

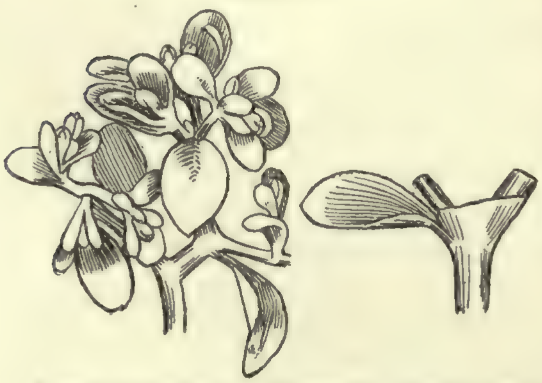
A. Flowers cyclic, small. Endosperm not ruminate.
  b. Stipules none.
    c. Partial inflorescence without an involucre. Stamens 3. Bracts smooth, not accrescent. Dwarf annual. 1. *Kœnigia* (*Macounastrum*).
    c2. Flowers involucrate. Stamens 9. 2. *Eriogonum.*
  b2. Stipules ochreate. Flowers 3-merous. Perianth more or less coriaceous about the fruit, yet not close. 3. *Rumex.*
A2. Flowers acyclic; floral leaves mostly upright in fruit.
  b. Endosperm not ruminate. Embryo small, not folded. 4. *Polygonum.*
  b2. Endosperm ruminate. Flowers hermaphrodite or polygamous. Perianth dry about the fruit, wingless. Climbers. 5. *Antigonum.*
  b3. Endosperm ruminate. Subdiœcious, twining plants. Perianth fleshy about the fruit, 5-partite. 6. *Muehlenbeckia.*

1. KŒNIGIA Linn. *Macounastrum* Small.

Dwarf, glabrous annuals, fleshy, subsessile. *Leaves* small, oval, entire, whorled at the top, differing below. *Flowers* few in the axils, crowded among the upper leaves, minute, articulated on the pedicels; each subtended by a bract, which is adnate to and shorter than its pedicel. *Perianth* deeply 3 (2–4)-cleft; *stamens* 3 (1–4), short. Nut trigonal or compressed. The name *Kœnigia* L., though dating from 1767, is rejected by Small, because of *Konig* of Adans, 1763. This may be justified by the confusion caused by several other applications of the same name, subsequent to 1767, as *Konigia*, *Koniga*, and *Kœniga;* but *Kœnigia* is not identical with *Konig* and has priority over the others.

Species 2, one (*K. islandica* L.) in arctic regions, extending to the Himalaya; the other in Fuegia. Fig. in Brit. & Br. i, 542.

FIG. 62.



Kœnigia fuegiana. Flowering branch; and (on right) stipular sheath (after Dusén).

K. FUEGIANA Dusén.

Intricately branching, sordid-green. Root fibrous, producing several, short, dichotomizing stems. Leaves fleshy, subsessile, alternate, crowding upwards, obtuse. Stipules connate, forming ample, short sheaths. Flowers in 3's or more, the apical small, yellow-green, with small, scarious bracts. Perianth 3-parted, its lobes erect, obtuse, oval or longer. Anthers 3. Stigmas 2, sessile, nearly globose. Seeds trigonal (Fig. 62).

S. Fuegia, by Rio Azopardo. (Dusén.) Lower and more densely branching than *K. islandica.*

2. ERIOGONUM Michx.

Stemless or leafy-stemmed herbs without ochreæ. *Flowers* small, in cymes, umbels or heads, subtended by *involucres.* *Calyx* 6-cleft or 6-partite. *Stamens* 9. *Style* 3-parted; *stigma* capitate. *Achene* 3-angled.

Species 160, chiefly in the Western United States.

E. AMEGHINOI Speg.

Curvembryum. Low, leafy annual; the *radical leaves* orbiculate, basally rounded or subcordate, long-petioled; the *cauline* elliptical or obovate, basally cuneate, short-petioled; when young somewhat villous, afterwards glabrate. *Peduncles* numerous, at first scapiform, afterwards 5–6-times dichotomizing, pubescent. *Involucre* sessile, campanulate, 5-lobed. *Perigonium* more or less pediceled, exsert; the segments narrow, acutish, pubescent, yellowish inside.

S. Patagon., in dry places between S. Julian and Rio Deseado, and near Lago Colu-huapi. Differs from *E. rotundifolium* Benth., by the sessile involucres, and narrower perigonial segments.

3. RUMEX Linn. Sorrel.

Stems leafy, grooved, with cylindrical sheathing *stipules* and paniculate flowers. *Calyx*, 2-seriate, each series 3-leaved; the inner 3 becoming wings in *fruit*, one or all having a basal tubercle. Stamens 6, short. *Style* 3-parted; *stigmas* tufted. *Achenes* trigonal.

Species 130, widespread in nontropical regions. Several in Chili and Argentina. Few in Brazil, Austral., or N. Zeal., 1 in Tristan; some in S. Afr.

KEY TO THE SPECIES.

A. Diœcious or polygamous; leaves more or less hastate (except *b*3.)
  b. Basal leaves stalked, upper sessile. Fruiting calyx enlarged. *acetosa.*
  *b*2. Leaves all stalked. Fruiting calyx not enlarged. Rootstalk creeping. *acetosella.*
  *b*3. Leaves rosulate, wavy, lanceolate. Stems short. *hippiatricus.*

A2. Hermaphrodite; leaves not hastate.
  b. Fruiting calyx entire. Leaves usually petiolate.
    c. Leaves narrow-spatulate, basi-attenuate. Outer fruiting sepals with large callus. *crisparia.*
    c2. Leaves oblong-lanceolate, basi-cordate, wavy. Fruiting sepals broad. *crispus.*
    c3. Leaves obovate to cuneate-oblong. Fruiting sepals elliptical. Racemes terminal leafless. *cuneifolius.*
    c4. Leaves oblong-linear, acuminate, runcinate. *magellanicus* (Camp.).
    c5. Leaves lanceolate, attenuate upwards, rounded at base. *magellanicus* (Gris.).
  b2. Fruiting calyx toothed or lacerate.
    c. Leaves narrow-lanceolate. Pedicels slender. Long, setaceous teeth from fruiting calyx. *maritimus.*
    c2. Lower leaves cordate-oblong, upper narrow.
      d. Fruiting sepals cordate, unequally enlarged. Inflorescence leafless. *pratensis.*
      d2. Fruiting sepals large and veiny. Uppermost leaves linear. *pulcher.*
  b3. Prostrate from thick taproot. Radical leaves narrow-linear. *decumbens.*

1. RUMEX ACETOSA Linn.

Stem 30–90 cm. tall. *Basal leaves* few, long-petiolate; *upper leaves* subsessile, 3–12 cm. long, oblong-hastate. *Sepals* in fruit oblong-cordate.

(Eurasia and temperate N. Amer. Fig. in Brit. & Br. i, p. 548.)

Falklands (introduced).

2. R. ACETOSELLA Linn. Sheep-sorrel.

Glabrous, annual or perennial herbs, with slender, erect stem, creeping *rootstock*, and diœcious flowers. *Leaves* narrow, hastate, 3–10 cm. long, obtuse or acute, petioled, the auricle entire or toothed; or upper leaves without auricle. *Sheath* silvery, soon lacerate. *Sepals* 1 mm., achene 2 mm. long. Foliage often of reddish hue.

(Eurasia, and through temperate and warm parts of N. Amer. Fig. in Brit. & Br. i, p. 547.)

Falklands. Punta Arenas (J. B. Hatcher). "This and the *R. acetosa* L., included in Gaudichaud's list, I consider undoubtedly as introduced plants, of which the seeds, being eaten by the birds, are by their agency transported to otherwise inaccessible cliffs." (J. D. Hooker.)

3. R. CRISPISSIMUS O. Ktze.

Low, *glabrous*, blackish herb, with ascending stems, to 10 cm. high. *Leaves* narrow-spatulate, obtuse, attenuate to a long petiole (blade over 3 cm. long, petiole the same). *Flowers* glomerulate, supported by long leaves. *Fruit* 1–1.5 mm. long, 3 outer calyx-segments small, erect, oblong, 3 inner ovate-acuminate, entire, all with large globose callus, not cordate. *Nut* triquetrous, fuscous.

Patagon., 50–53 lat., by Rio Sta. Cruz.

4. RUMEX CRISPUS Linn.

Tall. *Leaves* long, to 25 cm., crisped and wavy-edged, with long petioles; oblong or oblong-lanceolate, basi-cordate, with long petiole; the upper narrower. *Panicle* lax, *pedicels* exceeding the calyx.

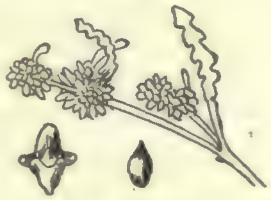
(Eurasia; nat. in N. Am.); Punta Arenas; through nearly all Patagonia; Falklands, introduced. *R. crispus sanguineus*, N. Patagon. S. Patagon., by RR. Sta. Cruz and Chico.

5. R. CUNEIFOLIUS Campd.

Ascending, 30–60 cm. *Leaves* petiolate, obovate or cuneate-oblong, obtuse, undulate-crenulate or plane. *Raceme* terminal, leafless. *Verticils* dense, the lower rather remote. *Calyx* exceeding the thickish pedicels. *Callus* on sepals, thick.

S. Brazil and Chili; Chonos Archip.; near Carmen de Patagones.

FIG. 63.



Rumex decumbens. — Branch with leaves and inflorescence; magnified fruit and achene. (After Dusén.)

6. R. DECUMBENS Dusén.

Prostrate, glabrous perennial, from thick tap-root, sending up several stems which are terete, mostly with *leaves* only at the verticils; also numerous long-petioled, narrow-linear, very crisp *radical leaves.* Floral *verticils* 1-leaved; the lower remote, the upper crowded. *Flowers* perfect; *perianth* segments oblong, the inner apically rounded, with *callus* below. Achenes acutely trigonal, brown, shining (Fig. 63).

S. Patagon., near Rio Coyle (Nordenskj.); N. and E. Fuegia, "in nearly all the lagunes of E. Fuegia" (Dusén).

7. R. HIPPIATRICUS Remy.

Glabrous. Rhizome thick, tortuose, with scaly top. Stems short, subsimple. *Leaves* nearly all radical, rosulate, nearly as long as the stems, lanceolate-acute, crisp-undulate. *Flowers* diœcious, in a terminal panicle. Perianth-segments oval, obtuse, entire.

(Mendoza); Patagon., in mountain swamps near Rio Carren-leofú.

8. RUMEX MAGELLANICUS Campd. (*Monogr. Rum.* 114). (Sp. dub.)

Leaves oblong-linear, runcinate, crest-margined. *Stipules* 25 mm. *Flowers* crowded, upper leafless.

Magellan.

9. R. MAGELLANICUS Griseb. (1854).

Leaves petiolate, lanceolate, wavy-crisp, attenuate-acute, rather rounded at base. Floral *verticils* many-flowered, contiguous. *Calyx-wings* of fruit elliptic, entire, faintly venous, all calliferous. "Inflorescence rich purple-red." Indian name Calcatreo.

Magellan, by Rio Sta. Cruz; valleys of N. Patagon., N. and E. Fuegia. Falklands.

10. R. MARITIMUS Linn.

Leaves narrow-lanceolate. Floral *verticils* much crowded, leafy. *Pedicels* slender, exceeding the *sepals*, which are narrow, 2–4-toothed, calliferous.

(Europe); N. Patagon., S. Patagon., near RR. Sta. Cruz and Chico.

R. MARITIMUS FUEGINUS (Phil). (*R. fueginus* Phil.)

Leaves linear, basi-truncate, rather obtuse. All the inner *perianth* segments calliferous (in Dusén's specimens; Phil. secus.).

S. Patagon.; E. Fuegia, "in almost all freshwater lagunes." (Dusén.)

11. R. PRATENSIS Mert. & Koch. (*R. acutus* L.)

Lower leaves oblong-cordate, acute, waved, *upper* lanceolate. *Sepals* in fruit broad triangular-ovate, entire at apex, toothed below.

N. Patagon., by Rio Negro. "Perhaps introduced." (J. Ball.)

12. R. PULCHER Linn.

To 90 cm. tall. *Branches* divaricate, rigid. *Leaves* below cordate-oblong to panduriform; above, lanceolate; uppermost linear. *Floral verticils* remote, leafless at top. *Calyx* exceeding pedicels. *Fruit-sepals* ovate-oblong, veiny, strongly toothed on margins, unequally calliferous.

(Old World, and nat. in U. S.); Magellan (Dusén); near Carmen de Patagones.

4. POLYGONUM Linn.

Flowers perfect, in terminal or axillary clusters. *Calyx* 4–5-parted, outer segments the larger. *Style* 2–3-parted, the *stigmas* capitate. *Achenes* invested by or exceeding the calyx.

Species 200, cosmopolitan save in the tropics; several in Chili, few in Brazil and Argentina.

KEY TO THE SPECIES.

A. Leaves lance-linear to oblong. Sheaths lacerate. Axillary flower-clusters.	*camporum.*
A2. Leaves lanceolate, acuminate both ways, style 2-parted.	*ferrugineum.*
A3. Leaves oblong-linear.	
b. Sheaths silvery, 2-parted. Flowers small, in axillary clusters.	*aviculare.*
b2. Sheaths at length lacerate. Flowers in 3's, peduncled.	*chilense.*
A4. Leaves elliptical to obovate.	
b. Sheaths bifid at first. Branches prostrate. Flowers fascicled.	*delfini.*
b2. Sheaths large, bifid or lacerate. Flowers none–3, axillary, pediceled.	*maritimum.*
A5. Leaves ovate-sagittate, the upper narrower, long-petioled. Stem twining.	*convolvulus.*

1. P. AVICULARE Linn.

Slender, glabrous, prostrate herbs, with oblong-linear, or oblanceolate, acute, subsessile *leaves*, jointed to the silvery, 2-parted sheaths. *Flowers* small, 1–5 in axillary clusters. *Calyx* 5-parted, green, bordered white or pink.

(Eurasia and N. Amer., a weed in cultivated lands); N. Patagon.; Magellan. (Dusén.)

2. P. CAMPORUM Meisner.

Glabrous, tall, slender-branched annual or perennial. *Leaves* sessile, linear-lanceolate to oblong, obtuse, 6–25 mm., deciduous with the lacerate sheaths. *Flowers* several, in axillary clusters, short-pediceled. *Stamens* 8. *Achene* trigonal, shining-black.

(N. Amer. in prairies, extending to S. Amer.); S. Patagon., by Rio Sta. Cruz.

P. CAMPORUM AUSTRALE Meis.

Upper *leaves* subulate-linear, revolute-margined. *Calyx* less than 2 mm. long.

(Argentina.); mouth of Rio Chubut. (Dusén.)

3. Polygonum chilense C. Koch.

Glabrous. *Leaves* oblong-linear, sessile, thickish, nearly parallel-nerved. *Sheaths* with oblong, nerved lobes, at length lacerate, about half as long as the leaf. *Flowers* campanulate, in 3's, rather long-peduncled. *Nutlets* shining, smooth.

(Chili); W. Patagon.; S. Patagon.; RR. Gallegos and Sta. Cruz; Magellan.

4. P. convolvulus Linn.

Glabrous, scurfy, annual, with twining *stem*, mostly branching. *Leaves* ovate-sagittate, the upper narrower, long-petioled, acuminate, subciliate. Axillary floral clusters lax. *Flowers* greenish, on slender pedicels. Calyx 5-parted. Stamens 8. *Style* subentire with 3 *stigmas*. *Achene* trigonal, obovoid-pyramidal, black, not shining.

(Old World, naturalized in N. Amer.); in cultivated lands near Carmen de Patagones.

5. P. delfini Phil. (*Avicularia.*)

Stem 20 cm. high. Branches herbaceous, prostrate. *Leaves* elliptical, concave, glabrous, pinnate-nerved, the lateral nerves obscure. *Sheaths* bifid, becoming lacerous. *Flowers* axillary, fascicled. *Achenes* long, smooth, trigonal at apex.

Valley of Rio Palena.

6. Polygonum ferrugineum Weddell. (*P. spectabile* Mart.)

Perennial, subglabrous, scurfy. Erect, 60–90 cm.; fleshy base, sparingly branched, with short internodes. *Leaves* lanceolate, 5–17 cm. long, acuminate both ways, with short hairs on midrib and short petiole. *Sheaths* cylindric, ciliate when young. Panicle subsimple, ending in linear, spicate racemes. *Calyx* pink, nerved; stamens 6–7, included. *Style* 2-parted to near its base. *Achene* lenticular, orbicular, biconvex, nearly black, shining.

(W. Indies and E. Brazil.)

P. ferrugineum patagonicum Speg.

Lower than the type, 15–20 cm. high. Primary cauline *leaves* when young hoary-puberulous on the under surface, then becoming glabrous like the others. *Sheaths* enlarged at the mouth, very thin without bristles. *Pedicels* subglabrous, obsoletely glandulous. *Achene* pale-fuscous, not shining.

Patagonia, near Cabo Raso, and Lago Colu-huapi.

7. POLYGONUM MARITIMUM Linn. Seaside Knotweed.

Root deep. Stem 20–50 cm. long, prostrate or ascending, branched, deeply striated. *Leaves* ovate to oblong, fleshy, about as long as the internodes, 6–24 mm. *Sheaths* large, 2-parted or lacerate above. *Flowers* 1–3 in the axils, slender-pediceled.

(Eur. and U. S., by the sea; also S. Afr.) S. Chili to Magellan.

N. and E. Fuegia. (Dusén.)

5. ANTIGONON Endl.

Climbing herbs from a woody base, the stem and branches ending in tendrils. *Leaves* alternate, usually cordate, with *ochreæ* small or mere lines. *Perianth* 5–6-partite, red, the outer 3 segments large, cordate, accrescent in fruit about the trigonal *achene*. *Stamens* about 8, on an annulus with intermediate teeth. *Styles* 3 with capitate stigmas. *Endosperm* ruminate.

Species 3–4, Mexico and southwards. (Cult. in gardens.)

A. LEPTOPUS Hook. & Arn.

Leaves ovate-cordate, acuminate, mostly tomentose underneath. *Rachis* of raceme ending in 3-hooked *tendrils*.

(Fig. in Eng. & Prantl, iii, 1*a*, p. 31, fig. 14.)

S. Chili; probably in N. Patagon.

6. MUEHLENBECKIA Meis.

Undershrubs like *Rumex*, often *twining*, with stalked, alternate leaves; *sheaths* small, or leafless; and *small*, polygamo-diœcious *flowers* in axillary or terminal fascicles. *Perianth* 5-cleft, fleshy, persistent. *Stamens* 8. *Styles* 3, with dilated stigmas. *Nut* trigonal, included, or apically exsert.

Species 15, Australia, N. Zeal., Pacific Is. and Extra-trop. S. Amer. (*M. platyclada* Meis., of Solomon's I., has flat phyllodes with very few leaves.)

1. MUEHLENBECKIA CHILENSIS Meis.

Branches twining, angulate. *Leaves* triangular to hastate-cordate, ovate or narrower, entire, without side-nerves. *Fascicles* racemed. *Achenes* globose, triangular upwards.

N. Patagon.; Valley of Limay; also in Chili; "called Sarsaparilla, and used medicinally." (J. Ball.)

2. M. ROTUNDATA PHIL.

Suffruticose? Branches short, erect. *Leaves* veinless, ovate, apically rounded, basicordate, rarely truncate. *Flowers* axillary, very shortly pediceled (not racemed), also a terminal leafless *spike*. *Achene*, included, subglobose, dull.

(Araucania); Chubut, in shrubberies near Lago Nahuel-huapi, and by Rio Carren-leofú. Branches about 18 cm. long.

Family 32. CHENOPODIACEÆ. Goosefoot Family.

Mostly herbs, with exstipulate, often lobed, or thickish, or fleshy leaves, and perfect or diclinous, apetalous flowers, with small greenish, 2–5-lobed calyx, and with or without bracts. Stamens equal and opposite to the calyx-lobes, filaments rarely united; anthers 2-celled. Ovary superior, 1-celled; styles 1–3. Ovule 1. Utricle indehiscent, rarely circumscissile, often enclosed in the persisting perianth. Embryo ring-like or spiral in mealy endosperm.

Species 550, widely distributed.

KEY TO THE GENERA.

A. Embryo ring-shaped or horse-shoe-shaped. (*Cyclolobeæ.*)
  b. Roots and seeds normal. Hermaphrodites; stamens 2–5, basiconnate. Leaves opposite, linear. Bracts exceeding the perianth. 1. *Nitrophila*, p. 355.
  b2. Roots, and mostly also the stem abnormal.
    c. Fruit becoming indurated below, dehiscing by a lid. Hermaphrodite, with cymose flowers. Stamens 5, proterandrous, basiconnate on a fleshy ring. Root fleshy. Seed horizontal. 2. *Beta*, p. 356.
    c2. Fruit normally indehiscent.
      d. Flowers glomerulate, rarely spicate. Leaves mostly alternate, often hastate, and often with glandular hairs.
        e. Flowers hermaphrodite, proterogynous, bractless. Perianth coriaceous, divided at least halfway.

f. Perianth-leaves 3–5, mostly unchanged in fruit. Stamens 5, or fewer, free or basi-connate. 3. *Chenopodium*, p. 356.

f2. Perianth urn-shaped, 3–5-toothed. Leaves pinnatifid. 4. *Roubieva*, p. 361.

f3. Perianth-leaf 1. Stamen 1, with a flat filament. Annual herb. 5. *Monolepis*, p. 362.

e2. Flowers mostly unisexual; the males bractless, with large perianth; the females without perianth, but with large bracts halfway connate about the fruit. Stamens 1–5, connate below. Leaves often with glandular hairs becoming scales. 6. *Atriplex*, p. 362.

d2. Flowers in club-shaped or conical inflorescences, or minute in the hollows of seemingly leafless stems; hermaphrodite, proterandrous. Perianth herbaceous or membranaceous, connate. Stamens 1–2. Leaves reduced, often united with the segments of the succulent, jointed branches.

e. Leaves subtending the flowers alternate, spirally placed.

f. Perianth above dorsally compressed, 4-angular, without wing-like borders. Perianth-leaves united with each other and with the bract. Small herbs with the lower leaves opposite, the upper alternate. 7. *Halopeplis*, p. 366.

f2. Perianth above extending on all sides, but without wing-like borders; its leaves free. Shrubs seemingly leafless, the segments broadening distally. 8. *Spirostachys*, p. 367.

f3. Perianth with wing-like borders. 9. *Heterostachys*, p. 368.

e2. Leaves that subtend the flowers opposite, connate, persisting; the flowers being like joints in the cavity. Embryo conduplicate; with scarcely any endosperm. 10. *Salicornia*, p. 368.

A2. Embryo planospiral (*Spirolobeæ*). Endosperm none or little.

b. Perianth hypogynous; its leaves not connate. Stamens 5. Leaves succulent, linear-subulate. 11. *Lerchea* (*Suæda*), p. 370.

b2. Perianth of female flowers none. Leaves linear-spatulate. 12. *Halophytum*, p. 371.

1. NITROPHILA S. Wats. (DC. sub *Banalia.*)

Small, succulent, dichotomously branching herb; with solitary, sometimes 3-glomerulate, flowers in the axils of the opposite leaves. Perianth-leaves pergamentaceous, ovate, obtuse, 1-nerved, the inner smaller. Stamens 5, with 4-celled anthers. Style long, stigma enlarged, papillose only on its inside. Fruit conical. Seed lenticular, shining black.

Only species.

N. OCCIDENTALIS S. Wats.

The Argentine and Patagonian forms do not branch dichotomously and have smaller leaves than the N. American. (Speg.)

(W. N. Amer., Argentina); Patagon., by Golfo de San Jorge; Rio Sta. Cruz. (Speg.)

2. BETA Linn. Beet.

As *Chenopodium*, except that each flower has 3 small bracts at its base, and that the ovary and seed are immersed in the succulent base of the perianth.

B. VULGARIS Linn.

Stem herbaceous, to 50 cm. high, with angled branches. Leaves acute or subobtuse, subsinuate or entire, undulate, glabrous, clear green or purplish; the lower ovate-oblong, with decurrent petioles; the upper subsessile, oblong. Spikes long, narrow, erect, in a bract-bearing panicle. Glomerules with 2–4 flowers, sessile, pale green, mostly digynous; fruiting calyces, 2–3-coalescent; their segments at length costate-carinate, apically inflexed.

Biennial (Mediterr. region, and widely cultivated); not rare near Carmen de Patagones (introduced).

3. CHENOPODIUM Linn. Goosefoot.

Leaves alternate, entire, or toothed, or lobed. Flowers bractless, minute, in compound spikes. Calyx green to fleshy, wingless in fruit. Stamens 1–5. Styles 2–3. Embryo annular.

Species 60, widely distributed.

Key to the Species.

- *A*. Perianth herbaceous in fruit, nearly closed. Embryo annular. No glandular hairs (but saccular hairs). (Sec. *Chenopodiastrum.*)
  - *b*. Leaves usually sinuate-dentate, basi-cuneate. Stem erect, sulcate, fruiting calyx keeled and closed. *album.*
  - *b2*. Leaves entire.
    - *c*. Stem slender, terete. Fruiting calyx keeled, not closed. *fuegianum.*
    - *c2*. Stem branching, striate. Fruiting calyx closed, not keeled. *vulvarium.*
- *A2*. Perianth enclosing the fruit. Flowers glomerate, spicate. Embryo curved but not completely annular. Style-base with glandular hairs. (Sec. *Ambrina.*)
  - *b*. Leaves subpetiolate, oblong, etc. *ambrosioides.*
- *A3*. Perianth persisting after fall of fruit. Flowers in loose subterminal dichasia. Glandular hairs on ovary, not on leaves or perianth. (Sec. *Botrydium.*)
  - *b*. Stem sulcate. Leaves subpinnatifid. Fruiting calyx not closed nor keeled. *botrys.*
- *A4*. Flowers glomerular. Perianth herbaceous on the fruit. Embryo incompletely annular. (Sec. *Pseudoblitum.*)
  - *b*. Leaves oblong to lanceolate. Plants succulent. Seeds minute, rugose. *glaucum.*
  - *b2*. Leaves more or less deltoid-ovate.

    c. Glomerules sessile and with a terminal spike. Seeds pitted. Stem prostrate. *antarcticum.*
    c2. Racemes densely flowered, leafless. Stem stout, fleshy. Seeds large, reticulate. *macrospermum.*
    c3. Glomerules simple or compound or spicate. Stem angular. Fruiting calyx incompletely closed. Seeds margined and pitted. *rubrum.*

A5. Low or depauperate.
  b. Leaves ovoid to trapezoid. Glomerules short. Seeds rounded. *patagonicum.*
  b2. Leaves minute, fleshy, 7 mm. long. *carnosulum.*
  b3. Leaves several-toothed on each side, mealy. Plant erect. *hircinum.*

A6. Perianth enclosing the fruit, afterwards stellately spreading. Leaves small, hastate, 3-lobed *scabricaule.*

A7. Perianth spreading in fruit. Leaves green, 3-nerved, 3-lobed. *ameghinoi.*

A8. Perianth closed in fruit. Annuals.
  b. Paniculate.
    c. Leaves deltoid, the lower hastate, 3-lobed. *ficifolium.*
    c2. Leaves rhombic-ovate, at length purplish, the lower auricled. *purpurascens.*
  b2. Subcorymbose. Leaves ovate-rhombic, sharply-toothed, glabrous. *murale.*

1. CHENOPODIUM ALBUM Moq.

Polymorphous, white to greenish. *Stem* herbaceous, erect, sulcate-striate, subramose. *Leaves* petiolate, ascending, rhombic-ovate, basi-cuneate, obtuse or acute, sinuate-dentate, sometimes subentire, slender, puberulent; the upper oblong, lance-linear, entire. *Racemes* paniculate, subspicate, dense or lax, nearly leafless. *Fruiting calyx* closed, carinate. *Seed* acute-margined, shining.

(Europe and N. Africa; Asia; Mex. and Cuba; Argentina); Patagon.

2. C. AMBROSIOIDES Linn. (Spachm. sub *Ambrina*.)

Pubescence glandular-aromatic, not farinose. *Stem* herbaceous, erect, sulcate, branching. *Leaves* subpetiolate, oblong, attenuate basewards, acutish, sinuate-dentate or subentire, puberulous, glandular-green underneath; the uppermost lance-linear, entire. *Racemes* glomerate-spicate, dense-flowered, leafy. *Fruiting calyx* closed, without a carina, with curious glands. *Seeds* obtuse, margined, shining.

(Fig. in Eng. & Prantl, iii, 1*a*, p. 58, K–Q.) (Cosmopolitan); in W. Patagon. and N. Patagon.

3. C. AMEGHINOI Speg.

(*Botryois*, odontophyllum.) Erect, fastigiately branching annual. *Stem* herbaceous, striate, glabrous. *Leaves* with slender, long petioles, ascending, green, not or very obscurely farinose, 3-nerved, subrhombic-lanceolate, 3-lobed; lobes all acute, lateral, small, cuneate downwards. *Racemes* leafless, divaricately cymose, dichotomous. *Fruiting calyx* subpatent; *sepals* acute, and very acutely carinate. *Utricle* rather large, subglobose. *Seed* horizontal, pallid-ferruginous, rather large, globose to sublenticular, with the margin broadly truncate, rostellate, not or scarcely shining, obsoletely and laxly subpapillose.

S. Patagon., in dry places near Rio Chico about Emelk-aike. Seed as in *C. purpurascens* Jacq.

4. CHENOPODIUM ANTARCTICUM Benth. & Hook. (Hook. f. sub *Blitum.*)

Stem prostrate-ascending, papillose. Leaves petiolate, deltoid-ovate, rather obtuse, sinuate-toothed. Glomerules sessile, compound, axillary and in a leafy terminal spike. Sepals 3, green, at length changing, exceeding the utricle, linear-spatulate, externally papulate. Seed vertical, orbicular, pitted, with obtuse margin.

S. Patagon., by Rio Sta. Cruz. (Hatcher; "Fruiting perianth scarcely papulate, short.") Staaten I. E. Fuegia. (Dusén.)

5. C. BOTRYS Linn.

Annual herb, with erect stem and sulcate, angulate branches. Leaves long-petioled, ascending, oblong, obtuse, subpinnatifid-sinuate, with obtuse lobules, glaucous-green, glandular hairy on both surfaces; upper leaves spatulate-lanceolate, subentire; uppermost as narrow bracts. Racemes divaricate, cymose, leafless. Fruiting calyx not closed nor keeled. Seed marginally obtuse, fine-channeled, smooth.

(Eurasia; naturalized in N. Amer.); Magellan, once at Elizabeth I.; these with lower leaves hastate-triangular, as if a depauperate *C. chilensis* Schrad.

6. C. CARNOSULUM DC.

Stem slender, erect, striate, branching. Leaves petiolate, minute (6–8 mm. long, the petiole included), rhombic, entire, subcarnose, furfuraceous-punctulate, pale green. Flowers minute, in short, dense, leafy racemes. Fruiting calyx subcarinate, incompletely closed.

Fuegia, Gregory Bay. (R. O. Cunningham.)

7. CHENOPODIUM FICIFOLIUM Smith.

Annual. *Stem* herbaceous, erect, striate, branching. *Leaves* with slender and long petioles, ascending, deltoid, basi-cuneate, obtuse or acutish, sinuate, subdentate, thin, farinose, glaucous-green, paler underneath; the inferior leaves hastate-subtrilobate, dentate, the upper subrhombic-oblong, the uppermost linear-lanceolate, entire. *Racemes* paniculate, rather lax, and nearly leafless. *Fruiting calyx* completely closed, acutely carinate. *Seed* with an obtuse margin, excavate-punctulate, slightly shining.

(Europe); S. Patagon., near Rio Chico and Rio Sta. Cruz. "Leaves whitish-farinose, especially underneath. Seeds lenticular, black, shining, margin sometimes obtuse, sometimes acute, smooth or obsoletely subpunctulate, 1–1.15 mm. diam." (Speg.)

8. C. FUEGIANUM Speg.

(*Chenopodiastrum.*) Entire-leaved, farinose, odorless, small. Stem mostly procumbent, slender, terete. Leaves petioled, minute, rhomboid, obtuse, coarsely membranous. Flowers glomerulate, axillary. Calyx in fruit with the keel not closed. Seed midsized, obtuse-margined, shining.

Chubut; S. Patagon., by Rio Sta. Cruz; Fuegia, Punta Anegada in Elizabeth I., on maritime dunes.

9. C. GLAUCUM Linn.

Succulent annual, much branched. Leaves slender-petioled, oblong to lanceolate, subsessile upwards, mealy underneath, the lower sinuate-toothed. Flowers in small, axillary clusters, or panicled above. Seed minute, rugose.

(Eur., nat. in N. Amer.)

C. GLAUCUM DIVARICATUM Hook. f.

Prostrate, with slender divaricate branches.

Chonos Archip., not northwards in the Andes. N. Patagon.

10. C. HIRCINUM Schrad. (*C. bonariense* Tenore.)

A depauperate, simple, erect form, with leaves coarsely 5–7-toothed on each side. Young leaves farinose on the two surfaces, at length glabrous on the upper surface.

S. Patagon., by R. Chico de Sta. Cruz; in fields by Lago Colu-huapi. Plant varying greatly by leaves, mealy to green, perigon not very carinate, seed black, in a thin utricle, more or less adherent. (Speg.)

11. CHENOPODIUM MACROSPERMUM Hook. f.

Glabrous, not glaucescent; stems stout, rather succulent, divaricately branching below. Leaves petioled, fleshy, deltoid-oblong, obtuse. Racemes compound, densely flowered, leafless, bracted. Seeds large, erect, reticulate.

Falklands; used as a potherb. S. Patagon., by R. Sta. Cruz.

12. C. MURALE Linn.

Annual. *Stem* herbaceous, ascending, sulcate-angulate, branching. *Leaves* petiolate, ascending, ovate-rhombic, acute, unequally and acutely toothed, thin, shining, green on both surfaces. *Racemes* divaricate-cymose, subcorymbose, rather lax and nearly leafless. *Fruiting calyx* usually closed, subcarinate. *Seed* with an acute margin, punctate-rugose, opaque.

(Old World); N. Patagon., common by the wayside near Carmen.

13. C. PATAGONICUM Phil.

Low, branching from the base, green. *Leaves* petioled, ovate or oblong-triangular, subtruncate at base, or trapezoid, entire, or with a tooth at the base on each side; upper leaves simpler. *Floral glomerules* shorter than the petioles. *Seed* rounded dorsally, opaque.

Valley of Rio Palena, in W. Patagon.

14. C. PURPURASCENS Jacq.

Annual, with herbaceous, erect, angular, branching *stem.* Leaves with slender, long petioles, spreading, rhomb-ovate, obtuse, mucronulate, thin, subpulverulent, obscurely green, at length purplish; lower leaves auriculate, sinuate-dentate; upper ones lanceolate, entire. *Racemes* paniculate, compact, leafless. *Fruiting calyx* completely closed, carinate-costulate. *Seed* with an obtuse margin, smooth, not shining (whitish).

(Asia; S. America); not rare by the waysides near Carmen de Patagones. Seed lenticular to subglobose, with small rostellum.

15. CHENOPODIUM RUBRUM Linn. (Reichb. sub *Blitum*).

Stem angular, branching. Leaves alternate, petioled, deltoid or deltoid-ovate, cuneate, obtuse, sinuate to dentate, thickish, shining, glaucous-green to reddish. Glomerules simple or compound, the upper spiked. Fruiting calyx incompletely closed, herbaceous or pitted. *Seed* obtuse, margined, pitted.

(Eurasia; Azores; also cult.); through Patagon., E. Fuegia. (Dusén.)

16. C. SCABRICAULE Speg.

(*Chenopodiastrum.*) Annual, low or minute, somewhat smooth-seeded, at first somewhat papulose-farinose, afterwards glabrate, green, rather erect; *branches* pallid-green, terete to angular, more or less callous-papillose, laxly or divaricately branching. *Leaves* small, membranaceous or thickish, conspicuously hastate-trilobed, all the lobes elongate, acute. *Flowers* in racemes. *Calyx-segments* green, slender, obtuse, retuse, not carinate, at first enclosing the fruit, afterwards more or less stellate-patent. *Seeds* lenticular, acutely carinate-margined, very finely reticulate, black and shining.

Rather rare along Rio Chubut, and Rio Chico (also in Mendoza Andes). Has different forms viz.:

(*a*) *pusillum*, 20–50 mm. high; leaves cruciately and acutely 3-lobed, fruiting calyx small. By Rio Chubut.

(*b*) *megalospermum*, 10–15 cm. high; leaves obtusely hastate-subtrilobed, fruiting calyx rather broad. By Rio Sta. Cruz.

(*c*) *robustum*, stout, 15–20 cm. high; leaves thickish, acutely hastate, trilobate, fruiting calyx mediocre.

17. C. VULVARIUM Linn.

Annual. Stem 30 cm. high, branching, striate. *Leaves* alternate, petioled, rhombic-ovate, 3 cm. long, entire, pulverulent-hoary. *Racemes* leafless, dense, spike-like. *Fruiting calyx* closed, without keel. *Seed* acutely margined, finely pitted, shining. *Odor* offensive.

(Eur. and N. Afr.); E. Fuegia. (Dusén.)

4. ROUBIEVA Moq. Tand.

Flowers mostly hermaphrodite, bractless. *Calyx* urceolate, 5-cleft, the lobes not appendaged, at length coalescing, as a pentagonal capsule.

Stamens 5; filaments thick. *Style* short, *stigmas* 3. *Utricle* compressed. *Seed* lenticular, erect; endosperm abundant; *embryo annular.*

A South American herb, near *Blitum.*

ROUBIEVA MULTIFIDA Moq. (Fig. in Brit. & Br. i, p. 576.)

Leaves pinnatifid, the segments lanceolate or linear, nerves prominent beneath. Penetrating *scent.*

Brazil to N. Patagon., near Carmen.

5. MONOLEPIS Schrad.

Branching annuals, with alternate, entire or lobed *leaves*, and minute, bractless *flowers*, in small axillary clusters, or solitary. *Flowers* with usually only 1 sepal, persisting by the flat utricle. *Stamen* 1. *Styles* 2. *Pericarp* adhering to seed. *Embryo* annular.

Species 3, N. E. Asia, and N. W. Amer., one passing to S. Amer.

M. CHENOPODIOIDES Moq. (*M. nuttalliana* R. & S. in Brit. & Br. i, 577.)

Stem 30 cm. Leaves trifid, hastate, acuminate, smaller upwards. Glomerules leafy. Seeds granulate.

(N. W. Can., to Calif. and southwards.) Patagon., by mouth of Rio Chubut (Dusén); by Carmen de Patagones; by Rio Deseado.

The Patagonian specimens are mostly small, glabrous, dull-green. (Speg.)

6. ATRIPLEX Linn.

Herbs or shrubs, with small, green, diœcious or monœcious *flowers* in axillary glomerules or panicled spikes. *Male flowers* bractless, *calyx* 3–5-parted, *stamens* as many. *Female flowers* without calyx, but with 2 bracts, which enlarge in fruit and partially unite. *Ovary* ovoid to globose; *stigmas* 2. *Embryo* annular.

Species 120, chiefly subtrop. and temperate.

KEY TO THE SPECIES.

A. Leaves more or less oblong.
  b. Leaves minute, sessile, mealy underneath, acutish. Prostrate, much branching. *montevidensis.*
  b2. Leaves subpetiolate, lepidote, obtuse. Erect, branching. *lampa.*

*b*3. Leaves petiolate, mealy, obtuse. Fruiting bracts round-cordate, 2-crested. *patagonica.*

*b*4. Leaves emarginate, wavy. Fruiting bracts rhomboid, tubercled. *undulata.*

*A*2. Monœcious. Leaves not oblong, except *b*2.

b. Leaves spatulate, subsessile. Tall shrubs, lepidote; male spikes above axillary glomerules. *pamparum.*

*b*2. Leaves oblong-elliptical, short-petioled. Prostrate, branching, grayish. Bracts deltoid, connate. *reichii.*

*b*3. Leaves ovate to hastate, subentire, sessile upwards; silvery. Flowers spicate-racemose. *ameghinoi.*

*b*4. Leaves hastate-deltoid to triangular-oblong, narrower upwards, green. Bracts veiny. *hortensis.*

*b*5. Leaves small, rhombic-ovate, entire, mealy; petioles twice as long. Glomerules axillary. *frigida.*

*A*3. Diœcious.

b. Leaves linear-elliptical, cuneate-petiolate, whitish. Fruiting bract triangular-ovate, smooth. *vulgatissima.*

*b*2. Leaves small, or suborbicular to elliptical, crowded, sessile or nearly so. Female glomerules with protruding styles. Bracts 2-crested. *macrostyla.*

*b*3. Leaves sessile, sagittate with long auricles. Bracts 3-nerved, not crested. *sagittifolia.*

1. ATRIPLEX AMEGHINOI Speg.

(*Obione.*) Monœcious, annual? Tall, all silvery-cinereous; *leaves* rather large, membranaceous, densely and minutely subpellucid-punctate, ovate or hastate, entire or obsoletely repand-subdentate, obtuse, subtriplinerved; the lower more or less long-petiolate; the upper sessile. *Flowers* long- and interruptedly subspicate-racemose. *Thecæ* of bracts cuneate-ovate or obtriangular, subtruncate, marginally 3–5-dentate, the upper submembranaceous and subsessile, the lower coarsely suberose in the disc, and largely 2-crested at the sides, all connate nearly to the apex.

Not rare in dry salines near Rio Chubut, and along Rio Chico. An erect herb, 25–60 cm. tall.

2. A. FRIGIDA Speg.

Monœcious, annual herb, all densely farinose-hoary. *Stems* a span high with stellately spreading, lax, alternate branches; the branchlets also prostrate. *Leaves* alternate, rather small, broadly ovate or rhomb-ovate, densely hoary-farinose on both surfaces, acute or obtuse, at base rotundate- or cuneate-subtruncate, entire, membranaceous, with petioles twice their length. *Flowers* glomerulate; glomerules all axillary, subglobose, half as long as the subtending leaf; *male flowers* minute with yellow exsert anthers; bracts of *female flowers* hoary, obovate, membranaceous, united to the apex, their upper margin subtruncate, obsoletely 3-dentate; disk slender, smooth. *Seed* not seen.

Dry stony places between San Julian and Rio Deseado. Root vertical, 10–15 cm. long.

3. ATRIPLEX HORTENSIS Linn.

Monœcious; the radicle inferior, sublateral. *Stem* erect, angulate, branching. *Leaves* alternate, petiolate, ascending, hastate-deltoid, to triangular-oblong, green both surfaces; upper leaves ovate-lanceolate, obtuse, mucronulate. *Bracts* ovate or round-ovate, not appendaged, reticulately venous.

(Asia and cult.); escaped in Chubut.

4. A. LAMPA Gill. (*A. ceratophylla* O. Ktze.)

Stem fruticose, erect, subangulate, substriate, branching much, the branches unarmed. *Leaves* alternate, subpetiolate, divaricate, oblong-attenuate downwards, obtuse, deeply sinuate-dentate, thickish, subcoriaceous, crispate-revolute, lepidote-hoary. *Theca* of the bracts very shortly stalked, ovate-rhomboid or subcordate, obtuse, the margin sinuate-denticulate, not appendaged by a disc, obsoletely reticulate nerved.

(Near Mendoza); by Rio Chubut, and Lago Nahuel-huapi. "Radicle of the cyclic embryo superior. *Atriplex lampa* O. Ktze., non Gill, is a widely different species." (Speg.)

5. A. MACROSTYLA Speg.

(*Obione.*) *Diœcious* perennial, all lepidote argenteous, low, with woody caudex, densely many-branched at its crown; the branches slender, terete, erect or prostrate, simple or sparsely subbranching, leafy. *Leaves* crowded or lax, alternate or subopposite, small, thickish but flaccid, occasionally suborbicular or elliptical, obtuse, entire, very shortly petiolate or sessile. *Flowers* densely congested in apical or axillary glomerules; the *males* comparatively large, ferruginous-lepidote; the *females* canescent-woolly, with very large exsert styles. Theca of bracts obdeltoid, hoary below, rounded-truncate and obsoletely tridentate above; long time bearing the exsert styles; at first compressed on the smooth disc, afterwards inflated, and more or less callous and 2-crested.

"Not rare in sandy salines by Rio Chico and Rio Deseado. Allied to, if not identical with, *A. reichei* Dusén." (Speg.)

6. ATRIPLEX MONTEVIDENSIS Spreng.

Suffruticose, perennial, prostrate-effuse, densely branching. *Leaves* alternate, sessile, minute, linear-oblong, acutish, entire, farinose underneath. *Bracts* connate above the middle. Apex of radicle and cotyledons superior.

(S. Brazil; Montevideo); N. Patagon., near Carmen; Golfo de San Jorge.

7. A. PAMPARUM Griseb. (*A. lorentzii* O. Ktze.)

(*Obione.*) Branching, lepidote-hoary, shrub nearly 2 meters high. *Leaves* sparse, spatulate, entire or repand, subsessile. *Flowers* monœcious. *Male* flowers uppermost, most of them in a leafless, interrupted spike. *Female* glomerules axillary, their *bracts* subsessile, cuneate, subrotund, united half-way, above unequally sinuate and toothed: *Teeth* obtuse, 2-crested dorsally.

(Chili); N. Patagon.

8. A. PATAGONICA Dietr.

Ascending, branching shrub. *Leaves* petiolate, oblong, basi-attenuate, obtuse, sinuate-toothed; thickish, coriaceous, farinose-hoary. Fruiting *bracts* orbiculate-cordate, entire, broadly 2-crested on back.

Patagonia.

9. A. REICHII Volkens.

Monœcious. Prostrate shrub, with gray, scrobiculate indumentum. Root thick; *stems* many, simple and naked below, branching and leafy above. *Leaves* short-petiolate, oblong-elliptical, obtuse, entire, larger above. *Male* flowers crowded at apex of branches, and in axillary glomerules; *female flowers* terminal and axillary, most of them in a short spike. Bracts deltoid, basiconnate.

E. Fuegia, above tide mark by the seaside. (Dusén.)

10. A. SAGITTIFOLIA Speg.

Diœcious shrub, over 1 meter high, intricately branching, unarmed, hoary. Leaves alternate, sessile, sagittate, entire; their auricles long, often involute into the axil, with white, cinerascent indumentum. Theca of bracts short-peduncled, orbicular to ovate, rounded below; above more or less 3-lobed; also dorsally plane, obsoletely 3-nerved, not crested.

Patagon., by R. Sta. Cruz; Chubut, near Rawson, etc.

11. ATRIPLEX UNDULATA Dietr.

Branching shrub. *Leaves* short-petioled, coriaceous, oblong, obtuse, emarginate, basi-attenuate, entire, wavy-crisped. *Fruiting bracts* minute, rhomboid, obtuse; their margin subsinuate; their back coarsely tubercled.

(Argentina); Patagonia.

12. A. VULGATISSIMA Speg.

Diœcious shrub, branching, unarmed. *Leaves* alternate, linear-elliptical, mostly obtuse, cuneate-petiolate; plane, thickish, membranaceous, white with a close indumentum. *Theca* of bracts sessile, mediocre, triangular-obovate, cuneate downwards, apically rounded to 3-toothed, dorsally smooth.

Patagon., by R. Sta. Cruz, and Golfo de San Jorge; at Puerto Madryn. (Dusén.)

7. HALOPEPLIS Bunge.

Small herbs, mostly with knotted branches, and rounded, fleshy *leaves*, opposite below, alternate above and embracing the stem. Oblong *strobiles* of perfect *flowers*, the *perianth* 4-angled, but 3-toothed; in groups of 3, with spirally arranged *bracts*, which are united to each other, and to the walls of their receptacle. *Stamens* 1–2, subsessile. Ovary pyriform, stigmas 2. Utricle obovoid, compressed. Seed subreniform.

Species 4, Mediterr. to Central Asia; and the following:

H. GILLESII Griseb.

Branches slender, not jointed. *Leaves* cordate-rotundate, concavo-convex, knot-like, imbricate in three rows along the ultimate branches. *Calyx* 3-cleft. (Cetera desunt.)

(Argentina); N. Patagon.

H. PATAGONICA (Moq. Tand. sub *Halostachys*).

Stem suffruticose, ascending, inarticulate, branches herbaceous, alternate, spreading-ascending. *Leaves* alternate, semiamplexicaul, appressed, ovate, obtuse. *Catkins* alternate, shortly peduncled, cylindraceous, obtuse.

Bahia Blanca; near Rio Negro; Peninsula Valdes.

8. SPIROSTACHYS S. Watson.

Glabrous shrubs, sometimes apparently *leafless*, erect, branching, fleshy; the branches mostly jointed, bilaterally broadening. *Strobiles* of perfect flowers, alternate, cylindraceous, with spirally arranged *bracts*, having 3–5 flowers in the axils. *Calyx* angulate upwards, 4–5-lobed or crenate. *Stamens* 1–2, exsert. *Ovary* lagenæform, compressed; *stigmas* 2. *Utricle* ovoid. *Seed* obovoid. (Fig. in Eng. & Prantl, iii, 1*a*, p. 77, M–O.)

Species 5, 1 in N. W. Amer.; others in extratrop. S. Amer.

1. S. OLIVASCENS Speg.

All obscurely green during life; fuscous olivascent *in sicco*. Branches slender, the old cinereous, the young whitish. *Leaves* small, fleshy, obscurely green, broadly ovate, sessile, semiamplexicaul. *Floral spikes* all conspicuously alternate, fuscous-green, sessile, short, elliptical or subglobose. *Perigonium* subtrifid, the lateral lobes acute, carinate-winged. *Stamens* paired; ovary glabrous; *seed* sublenticular; *rostellum* very small, glabrous, but minutely papillose-warty. *Embryo* terete-hippocrepiform; radicle inferior, subparallel with the cotyledons.

Common in salines by Rio Negro near Carmen.

2. S. PATAGONICA (Moq.) Benth. (O. Ktze. makes this *Allenrolfea*.)

Stem not jointed. *Leaves* alternate, semiamplexicaul, appressed, ovate-obtuse; fleshy, not 3 mm. long. Strobiles thick-cylindric. *Bracts* like the leaves, 3-flowered. *Seed* obovate-oblong.

(Argentina); N. Patagon., Chubut.

(*S. patagonica* is *Halopeplis patagonica* Moq.-Tand.)

3. S. RITTERIANA (Moquin-Tandon sub *Halostachys*).

Stem fruticose, erect, inarticulate, branches alternate, erect-appressed. *Leaves* alternate, semiamplexicaul, very appressed, cordate-ovate, rather obtuse, scale-formed. *Catkins* alternate, finely pedunculate, short, ovate-oblong, at length cylindrical, obtuse.

(Hispaniola, Mendoza); Patagon., Peninsula Valdes, Chubut, and near Rio Negro. Determination uncertain. A glaucous whitish shrub, the leaves caducous except from the young branches. Bracts like the leaves, but broader.

4. SPIROSTACHYS VAGINATA Griseb. (O. Ktze. places this under *Allenrolfea.*)

Cortex brown. Cauline *leaves* reduced to the sheath, and covering the whole internode, giving the appearance of a jointed branch; leaves when young obliquely truncate. Strobiles cylindric. *Bracts* 5-flowered, peltate. *Seed* obovate.

(In saline desert at Santiago di Estero, Argentina; N. Patagon.) (?).

9. HETEROSTACHYS Ung.-Sternb.

Much branching, fleshy, erect shrub, the branches subopposite, strict, and jointed. *Leaves* opposite, but distinct, densely imbricated, suborbiculate, obtuse. *Strobiles* with caducous scales, "certainly opposite" (spirally arranged, we think, B. & H.), the lower pediceled, the upper sessile, turgid. *Bracts* many-seriate, broader than long, free. *Flowers* concealed in the axils of the scales; *perianth* orbicular, compressed, broad-winged.

Only species:

E. RITTERIANA (Moq.) Ung.-Sternb.

(Argentina; Hispaniola); Patagon., Chubut, San José Peninsula.

10. SALICORNIA Linn.

Fleshy, glabrous, with opposite, terete *branches*, the *leaves* being reduced to opposite scales, forming cup-like sheaths at the nodes. *Flowers* sunken, 3–5 together in the upper axils, forming terminal spikes. *Stamens* 2 (1), exserted. *Stigmas* 2. *Utricle* enclosed by the spongy fruiting calyx.

Species 10, widely distributed in saline soil. Its ash is valuable as a supply of soda, and is called "Jume": giving by analysis 60 per cent. of soda salts (carbonate, chloride, and silicate), 19 per cent. of potash salts (phosphate and carbonate); also sulphate of lime, and magnesium carbonate.

1. S. BERGII Ltz. & Nied.

Erect shrub, with decussate branches, the *joints* 12 mm. long, terete and rigid, their sheaths very small, 2-lobed; the shorter branches, 40 mm. long, ending in thickish, cylindrical spikes; *spikes* 20 mm. long, narrowing upwards, obtuse. Flowers in 3's. *Calyx-lobes* 3. *Seed* brown, minute, ovoid.

N. Patagon., Rio Negro opposite Choele-choel.

2. SALICORNIA CORTICOSA (Walp., var. *nachtigalii.*)

Undershrub, 25–30 cm. high, many-stemmed, from a subterranean rhizome; *joints* 3 cm. long, with deep sheath. *Branches* erect, 6–10-jointed below the spike; the number decreasing upwards. Terminal spike with 4–6 pairs of slender lateral spikes starting below it. *Flowers* in 3's. *Seed* obovate, with small hairs.

Saline swamps through all Patagonia.

3. S. DOERINGII Ltz. & Nied.

Erect or procumbent undershrubs, with thick, rigid decussate *branches*, the joints 5–12 mm. long, their apex thick, ending in a low sheath. Spikes peduncled, small, slightly attenuate upwards, obtuse. Flowers in 3's. Fruiting calyx 3-toothed, with obscure wing. Seeds brown, minute, oval, with small recurved hairs.

N. Patagon., Neuquen; S. Patagon., in salinas by Rio Sta. Cruz; N. and E. Fuegia, near tidemark. (Dusén.)

4. S. FRUTICOSA Linn. (Forsk. sub *Suæda.*)

Stem fruticose, erect, 1 meter high or more, with many erect, leafy branches. *Flowers* in small axillary clusters, in 3's, or solitary. Calyx unchanged in fruit. *Seeds* shining, subrostellate.

(Eur. & N. Afr.) Patagon., in saline marshes of Rio Colorado, by Rio Sta. Cruz. N. Fuegia, at Catharine Point. (R. O. Cunningham.)

(Brit. & Br. i, 583, suggest that *S. ambigua* Mx. of E. U. S. may be identical with *S. fruticosa.*)

S. FRUTICOSA PERUVIANA.

Bolivia.

5. S. GAUDICHAUDIANA Moq.

Stem fruticose, erect; its branches subherbaceous, ascending, joints short, slightly thickened at the apex, their *sheaths* emarginate-bifid, with acutish lobes. *Spikes* subsessile, slender, scarcely attenuate, obtuse, winged. *Calyx* subtetragonal.

(Brazil); N. Patagon., Rio Negro.

6. SALICORNIA MAGELLANICA Phil.

Herbaceous, prostrate, rooting. *Joints* of the branches moderately long, thick towards the apex; their *sheaths* 2-lobed. *Spikes* sessile, thick, short, ovate.

Magellan.

11. LERCHEA Hall (1751, non Linn.). (*Dondia* Adans, 1763; *Suæda* Forsk., 1775.)

Saline herbs or shrubs, with alternate, narrowly linear or subterete, fleshy leaves; and axillary, bracteolate, very small flowers, solitary or clustered in the axils. Calyx 5-parted, thickish, in fruit keeled and enclosing the ovoid utricle. Stamens 5, short. Styles mostly 2. Embryo plano-spiral.

Species 50, on seashores and saline steppes. Rich in soda.

1. L. DIVARICATA (Moq.-Tand. sub *Suæda*) O. Ktze.

Stem fruticose, procumbent, branching, the branches very divaricate, obsoletely puberulous. Leaves semiterete, basally attenuate, acutish, rigid, scarcely puberulous. Flowers axillary, sessile, solitary, hermaphrodite. Fruiting calyx when dry subglobose. Seed with an obtuse margin, smooth, rather shining. Perennial shrub, 2–6 meters high; wood hard.

(S. Amer.); N. Patagon.; Chubut.

2. L. FRUTICOSA (L.) O. Ktze. (*L. maritima* v. *fruticosa.*)

L. FRUTICOSA BRACHYPHYLLA Speg.

Stems short, robust, subtrigonal, angulate, with slender, short branches. Leaves fleshy, thick, ovate, terete. Flowers in 1's or 3's, sessile at the axils. Seeds subglobose, shining black, 2–3 mm. diameter.

S. Patagon., by Rio Chico.

L. FRUTICOSA MEGALOSPERMA Speg.

Robust, erect, fastigiately branching; branchlets appressed, terete, densely leafy. Leaves elliptic-linear, semiterete; flowers 1–3 in the axils; sessile. Seeds vertical in the closed, fleshy perigonium, 4 by 3 mm., shining black.

S. Patagon., on Isla de Los Leones, at mouth of Rio Sta. Cruz.

3. LERCHEA MARITIMA (L.) O. Ktze.

Stem herbaceous, diffuse branching, the branches erect or prostrate, glabrous. Leaves long, plane on upper face, convex on under surface, basally dilating, often acutish, subflexuous, fleshy, glabrous, upper leaves shorter. Flowers axillary, sessile, 2–3-glomerate; fruiting calyx inflated, carinate, greenish. Seed rostellate, with acute margin, distinctly punctulate-rugose, shining. Annual.

(Old World); N. Patagon., in saline swamps near Rio Negro.

4. L. PATAGONICA Speg. (sub *Suæda*).

Glabrous, annual herb, prostrate-effuse, sparingly branching, with remote nodes. Leaves alternate, linear, acutish, flowers sessile in the axils, solitary or sparsely glomerate.

S. Patagon., in inundated maritime sands at Isla de Los Leones, in estuary of Rio Sta. Cruz.

12. HALOPHYTUM Spegazzini (Nova Addenda ad Floram Patagonicam, p. 152, Bonaria, 1902).

Char. Chenopodiacea, chenopodiea, cyclolobea, salicorniea, endocladantha.

Flowers unisexual, crowded in acrogenous or pleurogynous, unisexual strobili, at the axes of the bracts concealed in hollows of the rachis. *Perianth of male* flowers membranaceous, 4-leaved, the leaves linear, spathulate, free from the base, subimbricate, the lateral pair external, the median pair internal; *filaments* very slender, subulate; *anthers* linear, versatile, 2-locular, extrorse; no staminodes or rudiment of ovary. *Perianth of female* flowers none; *ovary* immersed in excavations of the axis, closely applied but not adnate; *style* subulate filiform, acutish, exsert, scarcely papillose; ovary 1-locular and 1-ovulate, the ovule on a short, basal, axile funicle. *Fruit* nut-like, on the subglobosely thickened, woody rachis of the strobili, which is mostly denuded of bracts; pericarp membranaceous; endocarp osseous; mesocarp hirsute-spongy; fruit becoming polystichously plurilocular, and the locules unequal by pressure, 1-seeded. *Seed* typically lenticular-reniform, minutely rostellate, the testa fuscous, adnate to the locular walls; *embryo* annular, terete, surrounding the pulverulent-amylaceous endosperm, apex of radicle and of cotyledons superior.

A monœcious shrub, glabrous, annual (?), *fleshy* and decumbent, the branches falsely *trichotomous*, not jointed; the *leaves* sessile, semiterete, fleshy, obtuse, the *spikes* or unisexual strobili solitary on the ends of the branches or laxly and few-gregariously sessile.

Allied to *Pachycornia* Hook. f., but very distinct.

HALOPHYTUM AMEGHINOI Speg. (*Tetragonia ameghinoi* Speg. in Nov. Add. ad Fl. Patag., n. 147).

Glabrous, mediocre annual with opposite or alternate, divaricate *branches*. *Leaves* sessile, linear, obtuse. *Flowers* solitary, sessile, or rarely stalked in the upper axils. *Sepals* 4, cruciate. *Ovary* obovate. Drupe 1–5-celled.

S. Patagon., by Rio Chico de la Sta. Cruz, and by Lago Viedma.

In sandy marshes in South Patagonia and Chubut.

The *female spikes* simulate densely leafy branchlets in bud.

Family 33. AMARANTACEÆ. Amaranth Family.

Herbs or (tropical) shrubs, with simple, thin *leaves*, and small, green or white, apetalous *flowers*, perfect or diclinous, *scarious-bracted* and *2-bracteolate*, often in spikes or heads. *Calyx-segments* 1–5. *Stamens* 1–5, hypogynous; anthers 1–2-celled; filaments mostly united below. *Ovary* 1-celled. *Stigmas* 1–3. *Ovules* 1, rarely more. *Fruit* mostly a circumscissile utricle or irregularly dehiscing, or indehiscent. *Embryo* annular. *Endosperm* large.

Species 425, most in warm countries.

Allied to *Chenopodiaceæ*, but differing by—

(*a*) Bracts scarious, not leafy.
(*b*) Habit less fleshy, and leaves thin.
(*c*) Frequent union of filaments.
(*d*) Sometimes by 1-celled anthers.
(*e*) Sometimes by plurality of seeds.
(*f*) Utricle not closely connected with the persisting perianth.
(*g*) Utricle being commonly circumscissile.

KEY TO THE GENERA.

A. Anthers 2-celled. Ovule erect. Leaves alternate.

b. Perianth-segments erect in anthesis. Flowers polygamo-diœcious. Stamens 2–5. Utricle indehiscent or circumscissile. 1. *Amarantus.*

b2. Monœcious. Perianth none. Stamens 2. 2. *Amarantellus.*

A2. Anthers 1-celled. Flowers hermaphrodite. Ovule suspended from top of funicle. Perianth-leaves free. Leaves opposite.

b. Stigma sessile, capitate. Perianth sessile amid bracteoles, pilose. Staminal tube 5-cleft, the antheriferous segments linear-ciliolate. 3. *Pfaffia.*

b2. Stigmas 2, subulate, or 2–3-branched. Perianth silky, its 5 segments free or basi-connate. Staminal tube long, 5-lobed, the lobes broad or fringed or trifid. 4. *Gomphrena.*

1. AMARANTUS Linn.

Annual herbs, with alternate, petiolate, pinnately veined *leaves*, and diclinous flowers in spikes or axillary glomerules. *Sepals* 2–5. *Stamens* 2–5, anthers 2-celled. *Styles* 2–3. *Fruit* circumscissile or indehiscent. Ovule 1, subsessile, erect.

Species 50, widely distributed.

1. A. BLITUM Linn. (*Euxolus viridis* Moq.)

Stem stout, branching, reddish. *Leaves* ovate, and various, obtuse to emarginate. *Flowers* in axillary spikelets, shorter than the petioles, with an erect, long, terminal spike. *Sepals* 3, lanceolate. *Seed* lenticular.

Old World; Brazil; N. Patagon., Rio Negro.

2. A. CRISTULATUS Speg.

Subcinereous-green, annual, 10–30 cm. high. *Stems* rosulate-effuse, numerous, pallid, striatulous. *Leaves* small, crowded, alternate, their limbs ovate or lanceolate, rather firm, obtuse, mostly complicate and densely wavy-crisped on the margin; petiole nearly as long. *Glomerules* all axillary, subglobose densely crowded. *Flowers* minute, very crowded; *sepals* 5, spatulate, obtuse, scarcely mucronulate. *Utricles* ovate, compressed, included, acutish, minutely 3-mucronulate.

N. Patagon., in dry sandy places between Rio Negro and Rio Colorado.

3. A. HYBRIDUS Linn. (*A. chlorostachys* W.)

Slender, dark-green to purple. *Flowers* chiefly in linear, terminal spikes. *Sepals* 5, cuspidate; *bracts* twice as long. *Seed* orbicular.

(Eurasia and Amer., N. and S.); Bahia Blanca and N. Patagon. "The young plant is eaten like spinach." (J. Ball.)

4. AMARANTUS VULGATISSIMUS Speg.

Stem procumbent, pale green, striatulous, glabrous. *Leaves* long-petiolate, ovate or lanceolate, obtuse or very obtuse, mucronulate, rigidly membranaceous, greenish to subcinerascent. *Glomerules* axillary, shorter than or equalling the petiole, the apical crowded in a simple or scarcely compound *raceme*, which is more or less elongate, erect and thick. *Flowers* small; *sepals* 5; spathulate, very obtuse, but mucronulate. *Utricle* sublenticular, smooth, enclosed in, or scarcely exceeding the perianth.

N. Patagon., not rare in cultivated places near Carmen de Patagones.

2. AMARANTELLUS Speg. (Plantæ novæ nonnullæ Amer. Austral., p. 343, 1901.)

Flowers monœcious, 1-bracted and 2-bracteolate. *Perianth* none. *Stamens* 2, oppositibracteolate; *anthers* short-ovate, 2-celled. *Ovary* ovoid, compressed; *style* very short, *stigmas* 3, subulate, papillose all over; *ovule* 1, subsessile, erect. *Utricle* twice as long as the bracts and bracteoles, ovoid, compressed, membranaceous, vesiculose, faintly 3-nerved, irregularly dehiscing, scarcely mucronulate. *Seed* vertical, erect, lenticular, with crustaceous testa, and no aril. *Embryo* annular, surrounding mealy endosperm; cotyledons linear, radicle inferior.

Decumbent annual herb, glabrous or scarcely pubescent. Leaves alternate; limb ovate, entire, acutish or apically retuse, basi-cuneate, long-petiolate. Flowers small, in axillary sympodial glomerules and a terminal raceme, green. Bracts and bracteoles membranaceous, persistent.

Habit of *Euxolus*, but the *absence of perianth*, and there being *only 2 stamens* distinguish it.

Species 1, common over all Argentina, and in N. Patagon.

A. ARGENTINUS Speg.

Stems glabrate or puberulous, rubicund or green, obsoletely striate, 15–50 cm. *Leaves* green, pallid underneath, with prominent whitish pinnate nerves, petioles as long as the limb. *Glomerules* axillary, small, mostly geminate, and an apical thick *raceme; bracts* elliptic, and *bracteoles* twice as long, oblanceolate, mucronulate, glabrous. *Utricles* pallid green, smooth.

(La Plata); N. Patagon., common by roadsides near Carmen.

3. PFAFFIA Mart.

Mostly tomentose herbs or undershrubs, with thick *rootstocks*, and slender, erect *stems; leaves* opposite, sessile or nearly sessile, generally tomentose. *Flowers* in dense, stalked heads or spikes. *Calyx* 5-parted, very hairy. *Staminal* tube long, its lobes ciliate-fimbriate. *Utricle* indehiscent.

Species 15, Brazil. (Fig. in Eng. & Prantl, iii, 1*a*, p. 116.)

P. LANATA (Poir). (*P. tomentosa* Mart.)

Tomentose undershrub. *Leaves* 1 cm. long, subsessile, oval, acute, mucronulate, subrepand-dentate. *Peduncle* long; *heads* solitary, subglobose, sulphur-white. *Sepals* scarcely exceeding the lateral bracts.

(Brazil); Bahia Blanca and N. Patagon.

4. GOMPHRENA Linn.

Branching hirsute-woolly herbs with opposite, entire *leaves*, and mostly swollen nodes. *Calyx* 5-parted. *Staminal* tube elongated, its lobes emarginate; anthers 1-celled. *Stigmas* mostly 2. Utricle ovoid-compressed, indehiscent. *Seed* 1, lenticular.

Species 90, chiefly in Central and S. Amer., 15 in Austral.

1. G. PERENNIS Linn.

Leaves short-petiolate, oblong-lanceolate, attenuate below, acute. *Heads* terminal and lateral, with 2 subfloral leaves; *flowers* shining pale yellowish.

(Argentina); N. Patagon. (?).

2. G. ROSEA Griseb.

Perennial, from a descending rhizome. *Stems* few, subsimple, 20 cm. high, strigose-woolly. *Leaves* lanceolate, acuminate, subsessile, equalling the lower internodes. *Head* terminal, hemispherical. Subfloral leaves 4, ovate-acuminate. *Sepals* woolly below, pink, oblong, linear, denticulate, carinately 1-nerved. Lateral bracts crestless, exceeding the calyx. *Staminal* tube shortly exsert.

(Argentina); probably in N. Patagon.

Family 34. NYCTAGINACEÆ. Family of Marvel-of-Peru, Four-o'clock.

Mostly herbs, with simple entire *leaves*, and regular, apetalous *flowers*, having inferior, synsepalous, corolla-like *calyx*, usually with an involucre of *bracts*. *Stamens* 1–many, hypogynous. Ovary 1-celled, with 1 basal ovule. *Style* 1, filiform, or none. *Fruit* an anthocarp, being a nut enclosed by the persisting, ribbed or winged base of the calyx.

Species 250, abounding in Amer.

(When the involucre is 1-flowered it and the calyx resemble the double perianth of a sympetalous dichlamyd.)

1. MIRABILIS Linn.

Herbs, branching di-trichotomously, with opposite *leaves*, the lower petiolate, the upper sessile, and calyx-like involucre which encloses 1 to several flowers in *cymes*. *Perianth-tube* long, constricted above the ovary, its limb 5-lobed, plicate and deciduous. *Stamens* 5–6, unequal, exserted, the filaments united below and incurved.

A small widely scattered genus, with 1 species in Himalaya, a few in N. Am., especially Calif., also in Mex., Peru, Chili, Argent. (Fig. in Eng. & Prantl, iii, 1*b*, p. 25.)

M. TOSCÆ (Ltz. sub *Oxybaphus*).

Rhizome thick, woody, sending up many stems. *Leaves* decussate, short-petiolate, subcordate-hastate, crenate, rough, nerves conspicuous underneath; 35 by 20 mm., smaller above. *Flowers* axillary from the upper leaves, 3 in the involucre, which has 5 acuminate processes with glandular hairs. *Stamens* 3. *Style* long, filiform.

(Argentina); N. Patagon.

2. BOUGAINVILLÆA Commers.

Shrubs or trees, often thorny and climbing, with alternate *leaves* and flowers devoid of involucre but inserted on the ribs of 1–3 large colored bracts. *Perianth* tubular-funnelform, twisted, often greenish below and white or pink above, often persisting in fruit as wings. *Stamens* 7–8, united below; anthers didymous, included. *Ovary* stipitate. *Anthocarp* fusiform, 5-costate.

Species 7, in warm parts of S. Amer.

1. BOUGAINVILLÆA PATAGONICA Decne.

Shrubs, with stout branches, unarmed and not well clothed by the fascicles of rather short, oblong-spatulate, subacute leaves. *Flowers* arising from 3 large bracts, larger and broader than the leaves. *Perigonial tube* long, slightly enlarged upwards, and with a 5-lobed spreading limb. *Stamens* 6, hypogynous. *Ovary* long, ovoid, with simple, sublateral *style.*

Patagon.

2. B. SPINOSA (*Tricycle spinosa* Cav.) Eng. & Prantl.

Spinous shrub, 3 meters high, with reddish branches, the spines at length forking apically. *Leaves* fasciculate on short branches, only 8 mm. long, linear-spatulate, coriaceous, glabrous. Flowers 1 cm. long, 1 or few at the nodes, pendulous, with 3 puberulous ovate-cordate bracts. *Perianth* with long, greenish tube, yellow limb, and 5 emarginate lobes. *Stamens* 5–6, unequal. *Ovary* fusiform with lateral style.

(Chili; Argentina); Patagon., near mouth of Rio Chubut. (Dusén.)

In dry places along Rio Negro.

Family 35. AIZOACEÆ (*Ficoideæ*). Carpet-weed Family.

Prostrate, branching herbs or undershrubs, with mostly fleshy *leaves*, often scariously stipulate; and small, regular *flowers*, having a 4–5-partite *calyx*, and *petals* small or none. *Stamens* 4–5 or fewer, perigynous. *Ovary* 3–5-celled, free. *Seeds* numerous. *Capsule* loculicidal or circumscissile. Embryo slender, curved around mealy endosperm.

Species 500, mostly in warm climates.

1. SESUVIUM Linn.

Fleshy, seaside, usually prostrate herbs, with smooth, opposite, exstipulate *leaves*, and solitary or clustered, axillary, 5-merous *flowers*. *Petals* none. *Sepals* colored inside. Styles 3–5. *Capsule* circumscissile. Seeds reniform.

Species 5, tropical and subtropical.

S. PORTULACASTRUM Linn. (non Gray).

Stem prostrate, spreading from a center. *Leaves* linear to lance-oblong, plane. *Flowers* with long or short pedicels. (Fig. in Eng. & Prantl, iii, 1*b*, p. 42 and 36, fig. 12*B*.)

(Old and New Worlds); N. Patagon., by Rio Negro.

2. TETRAGONIA Linn.

Herbs or undershrubs, with thickish, alternate, entire, exstipulate *leaves*, and green to yellow or red, apetalous, axillary *flowers*. *Calyx-tube* adnate to the ovary, bearing 1–more stamens. *Ovary* mostly 3–8-celled, with as many subulate styles and ovules. *Fruit* a winged or horned nut or drupe. *Seeds* subreniform.

Species 20, S. Afr., Orient, Austral. and S. Amer.

T. EXPANSA Murr. New Zealand Spinach.

Annual, with petiolate, ovate-rhomboid *leaves* and sessile *flowers*. *Stamens* in fascicles of 4–5, at each sinus of the calyx. *Fruit* obovoid, 4-horned, 6–8-seeded. Fig. in Eng. & Prantl, iii, 1*b*, p. 45.

(Japan; Australasia; New Zealand; Extratrop. S. Am. and cult.); W. Patagon.

(*T. ameghinoi* Speg. is *Halophytum*, supra p. 372.)

Family 36. PORTULACACEÆ. Purslane Family.

Herbs, rarely somewhat woody, generally fleshy, with regular, perfect, unsymmetrical *flowers*. *Sepals* usually 2, only rarely 5. *Petals* 4–5 or more, hypogynous. *Stamens* hypogynous, as many as the petals or fewer, rarely more. *Ovary* 1-celled, mostly superior; style 2–3-parted. *Capsule* circumscissile, or opening by 3 valves. *Embryo* curved.

Species 125, in tropical and subtropical countries; less abundant in colder parts. *Claytonia*, found in Siberia and N. Amer. and in mountains of Mex. and Cuba, is not found farther south in Amer.; but *C. australasica* Hook. is in Austral. and N. Zeal. *Calandrinia*, with 15 species in Australia, has 60 species in the American cordilleras from California to Patagonia.

KEY TO THE GENERA.

(All these are bisepalous except *Montia*.)

A. Ovary superior.

- *b*. Leaves alternate or basal. Stamens 5 or more. Ovules numerous. Embryo circular around the endosperm. 1. *Calandrinia*.
- *b2*. Leaves alternate. Stamens 8 or more. Seeds numerous. Embryo slightly curved, and endosperm scanty. Involucre consisting of dry imbricating bracts. Undershrub. 2. *Grahamia*.

*b*3. Leaves opposite. Flowers sympetalous, with 2–3 stamens and 3 ovules. Small aquatics. Sepals 3. 3. *Montia.*
*b*4. Stamen 1. Capsule 2-valved, with 1–2 black seeds. 5. *Monocosmia.*
*A*2. Ovary more or less inferior. Stamens 4–many. Seeds numerous. Fleshy herbs with alternate leaves. 4. *Portulaca.*

1. CALANDRINIA H. B. & K.

Leaves alternate or cespitose. *Flowers* solitary and long-stalked, or axillary, or in terminal racemes or heads. *Sepals* 2, ovate. *Petals* generally ephemeral. *Stamens* 5–many. *Ovary* free, many-ovulate. *Style* 3-cleft or sulcate. *Seeds* reniform.

Species 75, W. Amer. and Austral.

KEY TO THE SPECIES.

A. Leaves linear.
  b. Scapes 1-flowered. Plants glabrous; flowers purple. *rupestris.*
  *b*2. Scapes 1–3-flowered, sepals fimbriate. Plants viscous. *patagonica.*
  *b*3. Flowers corymbed. Sepals trifid. *trifida.*
  *b*4. Flowers capitate. Sepals 3-toothed. *prostrata.*
*A*2. Leaves lanceolate, all radical. Scapes 1-flowered. *densifolia.*
*A*3. Leaves narrow-oblong, attenuate petiolate, and sessile on stem. Flowers crowded on ends of the branches. *fasciculata.*

1. C. DENSIFOLIA Phil.

Cespitose, small. *Leaves* lanceolate, all radical, densely crowded, acutish. *Peduncles* radical, in fruit twice as long as the leaves. *Calyx* glabrous, its leaves ovate, entire, acute. *Capsule* as long as the calyx. *Seeds* smooth, shining.

(Andine elevations by Coquimbo.) Cordilleras of S. Patagon., on damp ground (J. B. Hatcher; in fruit Feb. 6, 1897). Rootstock as thick as a crow-quill. Leaves 20 by 3 mm.; pedicels 1-flowered; petals 4, ovate, subacute, twice as long as the sepals, thin-margined.

2. C. FASCICULATA Phil.

Glabrous. Stem erect, branching, 10 cm. high. *Leaves* narrow, oblong, attenuately petiolate; the cauline few and subsessile. *Flowers* crowded on the ends of the branches, sessile. Bracts large, orbicular, mucronate. *Sepals* subscarious, unequal, the outer larger and orbicular; the inner ovate. *Seeds* subpunctate, shining.

(Andes of Peru.)

3. CALANDRINIA PATAGONICA Speg.

Perennial, low, glaucescent, viscous. *Leaves* fasciculate at the base of the scapes, linear, subacute. *Scapes* scarcely surpassing the leaves, 1–3-flowered. *Sepals* ovate, glandular-viscous, fimbriate on the back and margin, shorter than the glabrous, milky, persistent *petals* and ovate *capsules.* Rhizome slender, long; branches above ground 3–6 cm. high, densely leafy at base and scape-like, with few flowers above.

Dry, sandy places by Rio Chico de Sta. Cruz and by Lago Argentino.

4. C. PROSTRATA Phil.

Prostrate annual, usually hairy. *Leaves* linear, or attenuate below, hispid, marginally appressed-ciliate. *Flowers* in dense heads, axillary and terminal; upper leaves as an involucre, not surpassing the flowers. *Sepals* dorsally hirsute, with compound hairs, mostly tridentate. Corolla purple. Seeds many, shining.

(Chili); dry meadows near Carren-leofú.

5. C. RUPESTRIS Gay.

Glabrous. *Stems* 25–50 mm. high, multicipital, cespitose. *Leaves* crowded at base, narrow-linear, fleshy, acute, entire, 12 mm. long. *Peduncles* radical, naked, simple, 1-flowered, 3–4 times as long as leaves. *Flowers* purple, naked; *style* 1, very short; *stigmas* 3, thick, subconnate. *Seeds* glabrous, rugulose.

(Chilian cordilleras); Patagon., Chubut, in stony parts of mountains. Leaves somewhat longer than in the description (to 25 mm.), their apex very attenuate, also attenuate downwards. Scapes rather rigid. (Speg.) By Rio Sta. Cruz. (Hatcher.)

6. C. TRIFIDA Hook. & Arn.

Annual, with stems more or less erect, simple, hairy. *Leaves* linear, acute, hairy, the radical elongated; the cauline long-ciliated. *Corymbs* dense, axillary. Lower *bracts* long-ciliated, exceeding the inflorescence. *Sepals* ovate, trifid, long-ciliate, hairy on the borders. *Stamens* 5.

(Valparaiso); Chubut, near Cholila. "The leaves may be obtuse or acute in the same plant. Seeds shining, gently reticulate-impressed. Is it *C. floribunda* Ph.?" (Speg.)

2. GRAHAMIA Gill. (*Xeranthus* Miers.)

Shrub, with alternate oblong, fleshy *leaves*, and *stipules* resolved into hairs. *Flowers* terminal, solitary, handsome. *Sepals* 2, rigid, striate, scarious-margined. *Bracts* numerous, imbricate, scarious. *Stamens* many, borne on the base of the petals. *Style* 4–5 cleft. *Seeds* winged.

Species 1, viz.:

G. BRACTEATA Gill.

Flowers white, the filaments reddish below.

N. Patagon.

3. MONTIA Linn. Water-chickweed.

Small, glabrous, aquatic annuals, tufted and freely branched. *Leaves* opposite, spatulate or obovate. *Flowers* nodding, solitary or racemed. *Sepals* 3. *Petals* ovate-oblong, united at the base. *Stamens* 2–3. *Capsule* 3-valved.

Species 1, in many local varieties, which may be regarded as separate species; in Eurasia, N. Afr., N. Amer. and by the Andes to Chili; also in Austral. and N. Zeal. and Kerguelen's I.

1. M. FONTANA Linn.

Inflorescence axillary and in terminal, panicled *racemes*. (Fig. 21 in Eng. & Prantl, iii, 1*b*, p. 58.) Falklands; Staaten I.; W. Magellan, at 400 meters elevation. (Dusén.)

2. M. GIBBA Griseb.

Sepals obscurely 3-lobed, gibbous on the back.

S. Chili.

4. PORTULACA Linn. Purslane.

Spreading, much-branched, fleshy herbs, with terminal *flowers*. *Sepals* united partly to each other and to the ovary. *Petals* 4–6, mostly 5, inserted on the calyx, fugacious. *Stamens* 7–many, on the calyx. *Style* 3–9-parted. *Ovules* many. Capsule circumscissile.

Species 20, tropical and subtrop.

1. P. OLERACEA Linn.

Leaves alternate or crowded at the ends of the branches, glabrous, fleshy, obovate-cuneate, rounded at the top. *Flowers* yellow; sepals broad, keeled, acutish. (Widely distributed in warm climates.)

N. Patagon., along Rio Negro., common.

2. PORTULACA PILOSA Linn.

Leaves linear, terete, obtuse, with tufts of hairs in the axils. *Flowers* sessile. *Petals* red, twice as long as the sepals.

(U. S. to S. Amer.); N. Patagon., along the Rio Negro, not rare.

P. PILOSA MUCRONATA (Link.).

Leaves oblong, sharply acuminate.

5. MONOCOSMIA Fenzl.

Sepals 2, persistent, with a dorsal nerve. *Petals* 3–4. *Stamen* 1, *Ovary* superior, with 1 *style* and 2 terminal *stigmas*, unilocular; *ovules* 3–4, basal. *Capsule* bivalved, 1–2-seeded. Annual herb, with prostrate stems. many leaves and minute flowers, in terminal and axillary inflorescences.

Species 1, Chili, Patagonia.

M. MONANDRA (R. & Pav. sub *Talinum*) Pax.

Basal *leaves* rhomboid-lanceolate, petiolate, cauline, sessile. *Seed* black.

(Chili); Chubut, in hills along Carren-leofú.

Family 37. CARYOPHYLLACEÆ. The Pink Family.

Herbs, with opposite, entire leaves, the nodes mostly swollen, and perfect, regular, 4–5-merous flowers with persistent calyx, free petals, stamens mostly twice as many, and superior 1-celled ovary with 2–5 styles and free central placenta. Embryo curved around endosperm. Petals sometimes none; and fruit sometimes a 1-seeded achene.

Species 1,500, abounding chiefly in the northern hemisphere (including *Paronychieæ* and *Illecebreæ* which are sometimes perigynous).

KEY TO THE GENERA.

*A*1. Sepals united (*Silenoideæ*). Stamens hypogynous. Leaves exstipulate.
  b. Styles 3 (4). Capsule-teeth twice as many. Capsule several-celled at its base.
    1. *Silene*, p. 383.
  *b*2. Styles 3–5. Capsule-teeth twice as many; capsule 1-celled from the base.
    3. *Melandryum*, p. 384.
  *b*3. Styles and capsule-teeth usually 5. Capsule 1-celled throughout.
    2. *Lychnis*, p. 384.
*A*2. Sepals distinct or nearly so (*Alsinoideæ*). Stamens often perigynous.
  b. Fruit a dehiscent capsule.

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c. Exstipulate.
  d. Petals deeply 2-cleft; rarely none.
    e. Capsule subovoid, dehiscing by valves. Styles 3 (4–5), antisepalous. 4. *Alsine* (*Stellaria*), p. 385.
    e2. Capsule cylindric, dehiscing by teeth. Styles as many as, and opposite, sepals. 5. *Cerastium*, p. 387.
  d2. Petals entire, or nearly so; rarely none.
    e. Gynecium isomerous (or pliomerous).
      f. Petals often none or short. Stamens isomerous and episepalous, or diplomerous. Minute plants. 6. *Sagina*, p. 390.
      f2. Petals none. Stamens isomerous but alternisepalous. 7. *Colobanthus*, p. 390.
    e2. Gynecium oligomerous, 1-celled. Carpels usually more than 2. Seeds many.
      f. Carpels with as many teeth as the styles. Disk thick, lobed. Maritime plants. 8. *Ammodenia*, p. 393.
      f2. Carpels with twice as many teeth as the styles. Disk annular. 9. *Arenaria*, p. 393.
c2. With scarious stipules. Carpels and styles 3. (*Tissa*, *Spergularia.*) 10. *Buda*, p. 395.
c3. With stipules. Leaves 4-ranked. Calyx-lobes, stamens and staminodes each 4. Ovary 1-celled, 1-ovuled. 14. *Philippiella*, p. 397.
b2. Fruit an achene, 1-seeded. Stamens perigynous.
  c. Leaves stipulate.
    d. Embryo curved. Sepals awn-tipped. Stamens 5 (3–4). Style filiform, 2-cleft. Petals hair-like. 11. *Paronychia*, p. 396.
    d2. Embryo straight. Sepals ending in a stout spine. 13. *Acanthonychia*, p. 397.
    d3. Small, sessile leaves, with small, green flowers in axillary clusters. 12. *Herniaria*, p. 396.
  c2. Leaves exstipulate. Calyx 4–5-lobed. Stamens 1–10. Styles 2, distinct. *Scleranthus.*

1. SILENE Linn. Campion.

Calyx synsepalous, 5-toothed; not bracted at base. *Petals* 5, narrow, clawed. *Stamens* 10. *Styles* mostly 3; *capsules* 6- or 3-toothed.

Species 250, widely distributed.

1. S. ANTIRRHINA Linn.

Annual, nearly glabrous. *Stem* erect, branching, leafy. *Leaves* oblanceolate, acute, subciliate, the upper narrower and smaller. *Flowers* small, on filiform pedicels, paniculate. *Calyx* narrow-ovoid, its teeth ovate. Petals obcordate, crowned.

(In E. United States); N. Patagon. by Carmen.

2. Silene antirrhina pteronema J. Ball.

Calyx-veins as prominent ridges. *Calyx-teeth* longer. *Capsule* ovoid, not globose.

Valleys near Bahia Blanca, to N. Patagon., Rio Negro.

3. S. behen L.

Glabrous, branching, with *lower leaves* petiolate, obovate-lanceolate, mucronulate, *upper leaves* sessile, ovate-lanceolate. *Calyx* ovate-inflated, striate-veiny. *Petals* pale pink, 2 lobed, the lobes short, obtuse, with 2 bicuspid appendages.—Crete, etc.

S. behen cucubalus (W.) O. Ktze. (*Silene cucubalus* Wibel.)

Leaves ovate. Capsule berry-like. A diffuse climber.

(Eur.; N. Afr.; Himalaya); Patagon.

2. LYCHNIS Linn.

Calyx synsepalous, 5-toothed, not bracted at base. *Petals* 5, clawed, generally crowned. *Stamens* 10. *Ovary* 5- (rarely 3–4-) valved; styles of the same number.

Species 35, Eurasian; abounding in Central and N. E. Asia, whence it came to N. W. Amer., thence to mountains of S. Amer. and Patagon.

L. antarctica O. Kuntz. (*L. chilensis* Speg. non Gay.)

Scapes often with 2–3 pairs of leaves. *Calyx* minutely glandular-puberulous (not crispidulous as in *L. chilensis* Gay).

S. Patagon., rocks near Lago Argentina. ("Probably a depauperate form of *Melandryum patagonicum* Speg.")

3. MELANDRYUM Roehl.

Calyx ventricose to campanulate, 10–20-ribbed. *Petals* bifid, crowned. *Capsule* 3–5-merous, its teeth twice as many.

Species 60, Eurasia, Nearctic; Andes.

1. M. chubutense (Speg. sub *Lychnis*).

Perennial, densely cespitose, with fasciculate branchlets. *Leaves* very narrowly linear, acute, glabrous, entire, marginally ciliolate. *Scapes* elongate, pubescent, 2–3-nodose, apically 1–3-flowered. *Calyx* ovate, glandular, pubescent, 10-nerved, with broad teeth. *Capsule* scarcely exserted.

Patagon., Chubut, by Rio Carren-leofú. "Distinguishable from *M. magellanicum* by its leaves being mostly broader, rigid, acute or subpungent, strongly carinate, margin often pectinate-ciliolate." (Speg.)

2. MELANDRYUM MAGELLANICUM (Desr. sub *Lychnis*) Fenzl.

Subvillous. *Roots* suffrutescent, bearing several rosettes of linear, grass-like *leaves*, and 3 pairs of rather broader, cauline leaves on the *scape*, 12 cm. high; mostly 1-flowered. *Petals* bifid, exceeding the campanulate *calyx*.

Allied to *M. apetalum* (L.) of the Arctic regions.

Patagon. Magellan (Hatcher); N. and E. Fuegia. (Dusén, "of the steppe-flora.")

3. M. PATAGONICUM Speg.

Perennial, laxly cespitose. *Branches* crowded, decumbent, densely leafy upwards. *Leaves* elliptic-lanceolate, acute, base very attenuate, densely glandular on both surfaces, hispid-velvety. *Scapes* axillary, long, naked, pubescent, 1-flowered. *Calyx* green, glandular-pubescent, obtusely 5-toothed.

Patagon., Chubut, by Lago Fontana.

4. ALSINE Linn. 1737. (*Stellaria* L. 1753.)

Tufted annuals, generally diffuse, with cymose, white *flowers*. *Petals* 2-partite, rarely none. *Styles* usually 3, rarely 4–5, oppositisepalous. *Capsule* ovoid, opening by twice as many valves as the styles.

Species 75; in temperate and cold climates. None in Brazil; a few in Chili.

KEY TO THE SPECIES.

A. Flowers axillary only. Leaves narrow.	
b. Leaves narrow-linear.	*axillaris*.
*b*2. Leaves linear-lanceolate.	*debilis*.
*A*2. Leaves linear. Flowers lateral or terminal, long-pediceled.	*chubutensis*.
*A*3. Flowers axillary and in terminal cymes. Leaves broader.	
b. Leaves lanceolate-oblong. Sepals exceeding the bifid petals.	*lanceolata*.
*b*2. Leaves lanceolate. Petals short or none. Seeds smooth.	*borealis*.
*b*3. Leaves rounded, 3-nerved.	*rotundifolia*.
*b*4. Leaves ovate to cordate. Ciliary line along the stem.	*media*.
*b*5. Lower leaves petiolate-cordate, upper leaves sessile, lanceolate.	*nemorum*.

1. ALSINE AXILLARIS (Phil.).

Glabrous, branching, cespitose, 20 mm. high, internodes twice as long as the linear *leaves*, which are attenuate both ways. *Peduncles* axillary, 1-flowered, equalling the leaf. *Petals* narrow, bifid, equalling the ovate-oblong *sepals*. *Capsule* scarcely exceeding the calyx.

(N. Chili); E. Fuegia.

2. A. BOREALIS (Bigel.) Brit.

Weak; much branched, *Leaves* lanceolate, or broader, 12–36 mm. long, acute, sessile. *Cyme* leafy. *Flowers* 4–8 mm. broad. *Petals* 2–5, shorter than the sepals, or none. *Capsules* exceeding the sepals. *Seeds* smooth.

(Eurasia; N. United States); S. Patagon., Killik Aike by Rio Gallegos. (J. B. Hatcher, Dec. 13, 1896.)

3. A. CHUBUTENSIS (Speg. sub *Stellaria*).

Slender, green, glabrous annual, 1–5 cm. high, decumbent or ascending. *Leaves* 1-nerved, linear, the lower obtusish, the others rather acute, about half as long as the internodes or more. *Flowers* erect, lateral or terminal, with pedicel as long, or twice as long as the subtending leaf. *Sepals* green, rather rigid, lanceolate, 3-nerved, acute. *Petals* white, bifid from the base, the segments narrow-linear, not or scarcely as long as the sepals.

Patagonia, in shady woods near Carren-leofú.

4. A. DEBILIS (d'Urv.).

Glabrous. *Stems* slender, prostrate, lax-cespitose, divaricately branching. *Leaves* flaccid, linear-lanceolate, subacute, 3-nerved; their margins finely cartilaginous, entire. *Peduncles* solitary in the axils, 1-flowered, shorter than the leaves. *Petals* shorter than the sepals. *Capsule* exserted.

Patagonia, by Rio Chico; Falklands; Staaten I.; N. and E. Fuegia. (Dusén, "in steppe-flora, especially in swamps.") "Allied to a Tasmanian species." (J. D. Hooker.)

A. DEBILIS CONDENSATA (A. Gray).

Leaves narrow-linear to almost filiform, slightly revolute.

Orange Harbor, Fuegia.

5. ALSINE LANCEOLATA (Poir).

Leaves lanceolate-oblong, acute, the *panicle* pubescent. *Sepals* exceeding the bifid petals.

Magellan. Fuegia.

(S. LANUGINOSA Rohrb. = *Arenaria lanuginosa.*)

6. A. MEDIA (Linn.). Common Chickweed.

Weak, tufted annual, mostly glabrous, but with a line of cilia along the stem, branches and petioles. *Leaves* ovate or oval, or the lower cordate, and petiolate. *Flowers* in terminal, leafy cymes, or also solitary on axillary pedicels. *Sepals* exceeding the petals.

(Eurasia, and naturalized in N. Am.); at Punta Arenas (J. B. Hatcher, Jan. 10, 1897); Falklands; Fuegia, Ushuaia. Rio Negro; L. Nahuelhaupi.

7. A. NEMORUM (L. sub *Stellaria*).

Stems weak, glabrous below, downy above. Lower leaves petiolate, cordate; upper *leaves* sessile, lanceolate. *Panicle* dichotomous. *Petals* bifid, twice as long as the sepals. *Seeds* orbicular, compressed, marginally tubercled.

(Old World; Bolivia); W. Patagon.

8. A. ROTUNDIFOLIA (Poir).

Branches virgate. *Leaves* petiolate, rounded, fleshy, 3-nerved, submucronate. *Panicle* terminal. *Petals* exceeding the sepals.

Magellan (not well known).

5. CERASTIUM Linn. Chickweed.

Suberect herbs, with terminal cymes. Sepals 5 (4), distinct. Petals emarginate or bifid, rarely none. Stamens 10, rarely fewer. Capsule cylindric, often curved, 10- (8-)toothed. Styles as many as the sepals, rarely fewer. Seeds rough. Flowers occasionally few or solitary.

Species 50, chiefly in temperate climates.

KEY TO THE SPECIES.

A. Leaves mostly sublinear. Flowers in cymes, or subpaniculate.
  b. Petals exceeding the sepals.
    c. Basal leaves linear-oblong, stem leaves linear-lanceolate. Petal obcordate. *arvense.*

c2. Leaves acuminate. Glandular hairy. *strictum.*
b2. Petals small. Leaves obtuse, viscid. Capsule curved upwards. *vulgatum.*
A2. Leaves linear, very long. Dichotomously umbellate. Petals as long as the sepals. *commersonianum.*
A3. Leaves oblong-linear, whorled, glabrous. Peduncles 3-flowered. *colsmanni.*
A4. Leaves lance-elliptical to linear-oblong, glandular. Peduncles 1- (2-)flowered. *fuegianum.*
A5. Leaves subovate, obtuse. Viscid. Cymes at length lax. Petals shorter than sepals.
b. Stamens 10. Cymes glomerate at first. *glomeratum.*
b2. Stamens 4–5. Tufted annual. *semidecandrum.*

1. CERASTIUM ARVENSE Linn.

Perennial, nearly glabrous, rather slender. Lower *leaves* and leaves of sterile shoots linear-oblong, crowded. Stem leaves distant, linear-lanceolate. *Flowers* cymose; *pedicels* slender; *petals* obcordate, greatly exceeding the sepals.

(Temperate parts of Eurasia and N. Amer. Common in Chili and S. Brazil.) Everywhere on the pampas of S. Patagon. (Hatcher & Peterson); Punta Arenas; Fuegia to Cape Horn. Falklands.

C. ARVENSE FUEGIANUM Hook. f.

Leaves ovate to ovate-lanceolate, long, coriaceous, imbricated. Flower solitary, terminal, large. Capsule slightly exceeding the calyx.

C. ARVENSE NERVOSUM (Naud.).

Specimens 1-flowered; *sepals* more or less purpurascent at the apex, laxly and minutely puberulous.

S. Andine Patagon., Baguales.

C. ARVENSE PARVIFLORUM Dusén.

Densely branching, the branches small and glandular. Panicles dense. Sepals scarcely scarious-edged. Petals scarious, exceeding the sepals.

S. Fuegia, Rio Grande. (Dusén.)

C. ARVENSE STRICTUM Hook. f.

Erect, strict, *flowers* paniculate.

2. C. COLSMANNI Lehm.

Stem strict. *Leaves* in whorls, fasciculate, reflexed, oblong-linear, glabrous. *Peduncles* terminal, about 3-flowered.

(Central European Alps.) Patagonia, Magellan.

3. CERASTIUM COMMERSONIANUM Ser. (*C. chilense* Baill.)

Stem dichotomous, angular, viscid. *Leaves* linear, very long, sessile. *Flowers* dichotomously umbellate. *Sepals* lanceolate, acute, scarcely membranaceous on margin. *Petals* and capsule as long as the sepals.

"Distinguished from *C. arvense* mainly by the foliaceous bracts with the edges not scarious." (J. Ball.)

(Montevideo; Argentina); N. Patagon.

4. C. FUEGIANUM Alboff.

Low, cespitose, glandular-pubescent. *Leaves* many, nearly 1 cm. long, lance-elliptical to linear-oblong, sessile, united at base, subobtuse, nerves prominent underneath. *Flowers* 1 (2), terminal, short-peduncled, 2-bracted. *Sepals* lanceolate, glandular. *Petals* oblong-obovate.

S. Fuegia, Ushuaia.

5. C. GLOMERATUM Thuill. (*C. viscosum* L.)

Stem hairy, viscid, spreading. *Leaves* ovate or obovate, obtuse, viscid. *Bracts* small, herbaceous. *Flowers* in glomerate cymes, at length paniculate. *Petals* shorter than the acute *sepals.*

(Eur., nat. in N. and Cent. Amer.); N. Patagon., not rare by Lago Nahuel-huapi and Rio Negro.

C. MAGELLANICUM Phil. is probably *C. arvense* L., changed in habit and form of leaves and indumentum.—Rohrbach in Linnæa, 37, 304.

6. C. SEMIDECANDRUM Linn.

Small, or 5-stamened Chickweed. Low tufted annual, finely viscid-pubescent. *Leaves* ovate-obtuse, only 4–8 mm. long. *Cymes* with the pedicels at length exceeding the sepals. *Flowers* small; *stamens* usually 4 or 5. *Petals* shorter than the sepals.

(Asia-minor, Eur.; E. United States); by water courses at Bahia Blanca and probably in N. Patagon.

7. C. STRICTUM Linn.

Perennial, with declinate *stems; leaves* sublinear, acuminate, glabrous or subhirsute. *Peduncles* glandular-pubescent. *Petals* twice as large as calyx. *Capsules* oblong.

(Eur.); S. Patagon., in gravelly meadows by San Julian; Chubut, common in elevated plains.

8. CERASTIUM VULGATUM Linn. (including *C. triviale* Link).

Tufted, viscid-pubescent. *Leaves* linear, obtuse. *Flowers* lax-cymose. *Pedicels* at length exceeding the sepals. *Capsules* curved upwards.

(Eurasia; N. Amer.); Magellan; Falklands, introduced.

6. SAGINA Linn. Pearl-wort.

Tufted herbs, with subulate *leaves* and small, pediceled, whitish *flowers*. *Sepals* 4–5. *Petals* 4–5, entire or emarginate, or none. *Stamens* varying to twice as many. *Ovary* 1-celled; ovules many. *Styles* as many as the sepals. *Capsule* 4–5-valved, dehiscing to the base; valves antisepalous.

Species 10, of the N. Hemisphere.

1. S. APETALA Linn.

Erect or ascending, filiform annual, 2–10 cm. high. *Leaves* linear-subulate, glabrous or subciliate, 2–8 mm. long. *Flowers* 2 mm. broad or less; on erect, capillary pedicels. *Sepals* 4, obtuse; *petals* none or minute. *Capsule* exceeding the perianth.

(Eur., N. Amer.); N. Patagon., meadows by Rio Negro. The Patagonian forms are glabrous, of two varieties: (1) *melanopotamica*, with long internodes; (2) *paludosa*, erect and rigid, only 1–3 cm. high, leaves long-acutate-aristulate.

2. S. PROCUMBENS Linn.

Plant depressed, 25–75 mm. high. *Flowers* mostly 4-merous. *Petals* short, usually present. *Capsule* at length nodding. *Seeds* dark red, pitted.

(Eurasia and E. N. Amer. and in S. Amer. Cordilleras.) Falklands, abundant near the sea. Fuegia (?).

7. COLOBANTHUS Bartl.

Cespitose herbs, often fleshy, with imbricate *leaves* and mostly solitary, stalked *flowers*. *Sepals* 4–5, free. *Petals* none. Stamens, *styles* and valves of the capsule as many as and alternate with the sepals.

Species 10, in mountains of Antarctic Amer. and of Chili. Also in Austral., N. Zeal., Kerguelen and Amsterdam and Auckland Is.

In *Colobanthus* the styles alternate with the sepals. Benth. & Hook. represent it as having the valves oppositisepalous; but Flora Antarctica is different; this is confirmed by Hatcher's specimen of *C. billardieri* and by Eng. & Prantl, iii, 1*b*, p. 78.

KEY TO THE SPECIES.

A. Leaves small.	
b. Sepals ovate, obtuse.	*cherlerioides.*
b2. Sepals acute.	*lycopodioides.*
A2. Leaves narrow-linear.	
b. Leaves pectinate. Sepals ovate, setulose.	*chubutensis.*
b2. Leaves spiny-tipped. Sepals acute.	*quitensis.*
A3. Leaves linear, obtuse or mucronate. Sepals ovate, obtuse.	*crassifolius.*
A4. Leaves linear-subulate or linear-lanceolate, imbricate. Sepals lance-acuminate.	*subulatus.*
A5. Leaves thick, obtusely-acutish. Sepals lanceolate, acute.	*billardieri.*

1. COLOBANTHUS BILLARDIERI Fenzl.

Stout, short stems, with thick, pallid *leaves*, "obtusely-acutish," about 15 mm. by 1.7 mm.; and long, straight *scapes*. *Sepals* lanceolate, acute. (In Australia, New Zeal., Campbell's I., "banks near the sea." Patagon., by Rio Coy and Cabo Negro; in fruit Dec. 17, 1896. Seeds crimson, smooth.)

2. C. CHERLERIOIDES Hook. f.

Densely cespitose, pulvinate, the branches fastigiate, leafy. *Leaves* small, closely imbricate, short-ovate, subacute, coriaceous, united at base into a broad sheath; their margins subciliate. *Peduncles* very short. *Flowers* 5-merous, sessile among the upper leaves. *Sepals* broad, ovate, obtuse. *Capsule* cleft to the middle.

(Chili, at great elevations.) Patagonia (?).

3. C. CHUBUTENSIS Speg.

Hirsute perennial, with robust, many-headed *caudex*. *Leaves* narrowly linear, acutish, marginally pectinate-setose towards the base, elsewhere having few appressed setulæ. *Scapes* twice as long as the leaves, glabrous, few-leaved, corymbose. *Sepals* ovate, glabrous, marginally setulose; *corollas* violaceous, glabrous. *Stamens* 5–6. *Capsule* one third exsert. *Seeds* wingless, shining, reticulately impressed.

Chubut, in dry hills, near Cholila.

4. COLOBANTHUS CRASSIFOLIUS Hook. f.

Glabrous, thickish, stems numerous, erect, branching. *Leaves* linear, obtuse or mucronate, sheathing at base. *Peduncles* shorter than the leaves, elongating in fruit. *Sepals* ovate or ovate-lanceolate, obtuse, equalling or exceeding the 5-valved capsule. *Seeds* dark-red, pubescent.

Falklands, Magellan to Cape Horn. S. Patagon. by Rio Gallegos. (Nordenskj., "by brooks, etc., over the steppes.") Fuegia, common near the coast.

C. CRASSIFOLIUS ARETIOIDES (Gill.).

Root fleshy. Calyx 5-parted, the segments ovate. Capsule exceeding the calyx.

5. C. LYCOPODIOIDES Griseb. (*C. lechleri* Phil. *C. polycnemoides* Hier.)

Densely tufted, smooth, coriaceous. *Stems* erect, branching, the branches spreading. *Leaves* small, ovate-lanceolate, united at the base; acute-concave above. *Peduncles* terminal, 1–2-flowered, shorter than the leaves, not elongated in fruit. *Flowers* 5-merous, very small, axillary. *Sepals* acute, twice as long as the 5-valved *capsule.* Forming dense peat.

(Andes); S. Patagon.; Magellan, Elizabeth I. N. Fuegia.

(*C. muscoides* from Auckland Isles has fine moss-like leaves.)

6. C. QUITENSIS Bartl.

Plant corticose, extensive hard turf springing from thick roots. *Leaves* in radical rosettes, very narrow-linear, acute, spiny-tipped, rather fleshy: 2 cm. long. *Peduncles* longer, twice-jointed in the lower part. *Flowers* 5-merous. *Sepals* acute. *Seeds* on a long funicle.

(Asia; Arctic America; Rocky Mts.; Cordilleras); Cabo Negro and Rio Coy. (Hatcher.)

C. QUITENSIS var. Harder cespitose. Leaves shorter, equalling the peduncles.

(Rocks of Chiloe); Magellan.

7. C. SUBULATUS (d'Urv. sub *Sagina*) Hook. f.

Low, bushy, like *Lycopodium.* *Stem* covered by the imbricated leaves, which are linear-subulate or linear-lanceolate. *Sepals* lance-acuminate. *Capsule* 2–5 mm. long, ovoid, 4–5-valved, the valves apically recurved.

S. Patagon.; Magellan, N. and S. Fuegia (Dusén, "near Ushuaia at 500–1,000 m. above the sea.")

8. AMMODENIA Gmel. (*Honkenya* Ehrh.)

Perennial, fleshy, maritime herbs with rather large, shining, decussate *leaves*, and rather small, 4–5-merous, polygamous *flowers*, *petals* entire, and *stamens* twice as many. *Disk* prominent, 8–10-lobed. *Styles* 3–5; *capsule* globose, 3–5-valved.

Species 1, viz.:

A. PEPLOIDES (L. sub *Arenaria;* Wahl. sub *Alsine*). Sea-purslane.

With creeping *rhizome*, 4-angled *stem*, and yellowish-green *leaves*. *Seeds* about 10, black.

Seabeaches through the N. Temperate zone. S. Patagon. (J. B. Hatcher.)

(The form found in California is considered by some authors as a separate species, *A. oblongifolia*).

9. ARENARIA Linn. Sandwort.

Generally tufted, with terminal cymose or capitate, often solitary, 5-merous, white *flowers*. *Petals* scarcely emarginate, rarely none. *Stamens* 10. *Styles* usually fewer than the sepals. *Capsules* dehiscing by teeth. *Seeds* reniform-globose.

Species 150, extra-tropical.

KEY TO THE SPECIES.

- *A.* Leaves 4-ranked, imbricated. *dicranoides.*
- *A2.* Leaves opposite.
  - *b.* Flowers solitary.
    - *c.* Leaves short, rough. *alsinoides.*
    - *c2.* Leaves acuminate, basi-attenuate, hairy. *lanuginosa.*
    - *c3.* Leaves thickish, close, awned. Petals none. *serpens andina.*
  - *b2.* Flowers few.
    - *c.* Leaves lance-linear, broad in the middle. *patagonica.*
    - *c2.* Leaves oblong, obtuse, thickish.
      - *d.* Petals short. Long creepers. *serpens.*
      - *d2.* Petals exceeding sepals. Stems short. *serpylloides.*

1. A. ALSINOIDES Willd.

Stems diffuse, furrowed or quadrangular upward; branches opposite mostly and pubescent, the hairs uncinately reflexed. *Leaves* linear or subulate, or broad, usually shorter than the internodes, puberulent, scabrous. *Flowers* solitary on long axillary, filiform peduncles, puberulous, in fruit curved upwards. *Calyx-lobes* ovate, acuminate, carinate. *Petals* oblong-obtuse, white, shorter than the calyx; rarely none. *Ovary* subglobose, 6-valved; few-seeded.

Variable. One form is low, with simple, 1-flowered stems and short, pungent leaves. Inflorescence sometimes diffuse.

(N. & S. Amer.) S. Patagon. (Hatcher.)

2. ARENARIA DICRANOIDES H. B. & K. (*A. radians* Benth.)

Cespitose, glabrous. *Leaves* imbricate in 4 ranks, ovate-lanceolate, acute, concave, 1-nerved, ciliate, 4–5 cm. long, connate at the base. *Flowers* terminal, solitary, sessile, digynous. *Calyx-leaves* oblong, acute. *Petals* spatulate, exceeding the calyx. *Filaments* connate at base. *Styles* 2. *Seeds* 4.

(Mt. Antisana; Bolivia, per Gray Herbm.); S. Patagon. (Hatcher. The leaves have black spots, consisting of ascospores of fungus.)

(A. GRANDIS = *Buda grandis.*)

3. A. LANUGINOSA Rohrb.

Lax, procumbent, puberulous. *Leaves* linear, or ovate-lanceolate, acuminate, attenuate at the base. *Flowers* solitary, axillary. *Calyx-segments* carinate, acuminate. *Seeds* lenticular, smooth, shining.

(Mex. to Argent.) (Probably the same as *A. alsinoides* W.)

A. LANUGINOSA DIFFUSA (*A. diffusa* Ell.).

(Bolivia); Patagon.

4. A. PATAGONICA Phil. (*A. palustris patagonica* Reiche.)

Stems rough with remains of dead leaves *Leaves* lance-linear, broad in the middle. *Flowers* on the apex of the branches, not crowded. *Petals* lanceolate, slightly exceeding the calyx.

Patagonia.

(Philippi's description seems to belong to a different plant. That given above is chiefly from Reiche.)

5. A. SERPENS H. B. & K.

Glabrous, much branching, with long creepers. *Leaves* oblong, subspatulate, obtuse, somewhat fleshy, veinless, basiciliate. *Petals* scarcely exceeding the sepals. *Seeds* about 15, smooth and shining.

(Mex., Mt. Chimborazo.) S. Patagon. (Hatcher.) "Everywhere over all Patagonia; variable."

ARENARIA SERPENS ANDINA Rohrb.

Leaves close, thickish, subaristate. *Flowers* solitary, terminal. *Petai* none. *Stamens* 5.

(Bolivia); Patagonia.

A. SERPENS ROBUSTA Speg.

Leaves linear-lanceolate, fleshy, green to purplish.

In saline places near Rio Chico de la Sta. Cruz.

6. A. SERPYLLOIDES Naud.

Stems short, ascending; cortex white, glaucescent. *Leaves* not very remote, somewhat fleshy, oblong-obovate or cuneate, obtuse. *Flowers* sparse at the ends of the branches, terminal and axillary, short-pediceled. *Calyx-lobes* with non-inflexed apex. *Petals* half-longer than the calyx.

("Var. of *A. serpens*" Rohrbach.)

Patagonia, by saline lakes near Golfo de San Jorge.

A. SERPYLLOIDES ANDICOLA (Gill. as *A. andicola*).

Leaves linear-oblong, subspatulate. *Peduncles* axillary, 1-flowered, longer than the leaf. *Sepals* obtuse, as long as the petals. *Capsule* about 4-valved. *Seeds* smooth, black.

(Chili): Patagon, Valley of Rio Gallegos (Nordensk.); and by Rio Sta. Cruz.

10. BUDA Adans (1763). Sandspurrey. (*Tissa* Adans, 1763. *Spergularia* Pers., 1805. *Lepigonum* Wahl., 1820.)

Low herbs, with very narrow *leaves*, having scaly, thin *stipules*. *Sepals* 5. *Petals* 5, entire. *Stamens* 2–10. *Styles* and valves of capsule mostly 3, rarely 5, the valves then alternisepalous.

Species 4, in temperate regions, especially saline and littoral.

1. B. GRANDIS (H. B. & K. sub *Arenaria*).

Perennial, suffrutescent, *stems* erect, glandular-hairy above. *Leaves* whorled, exceeding the internodes. Stipules united at their base. *Calyx* glandular-pubescent, 5–6 mm. long. *Petals* nearly as long. *Capsule* slightly longer. *Seed* with a white wing. Flowers secund.

(Brazil, Chili); Patagon, in meadows by San Julian; forms with a short glandular indumentum, but scarcely making a viscous variety.

2. BUDA MARINA Dumort. (*Arenaria media* DC., non L.; *A. rubra* var. *marina* L.)

Leaves semicylindrical, fleshy, as long as the internodes. *Sepals* lance-ovate, obtusish, scarious-margined. *Peduncles* after flowering deflexed. *Seeds* winged.

(Europe, in saline meadows by the sea; U. S. along the Atlantic); Patagon.

3. B. PLATENSIS (Camb.).

Stems slender. *Stipules* subequal, united half or third way up. *Petals* in the lower flowers ovate; in the upper none. *Capsule* slightly exserted. *Seeds* tubercled.

(Chili; Argentina); N. Patagon. (?).

11. PARONYCHIA Juss.

Tufted herbs, with scarious *stipules* and *bracts;* and small, clustered, apetalous *flowers*. *Calyx* 5-parted, the segments mostly bristle-pointed. *Stamens* 5, or with 5 additional staminodes. *Style* 2-cleft. *Utricle* 1-seeded.

Species 40, in warm and temperate climates.

P. CHILENSIS DC.

Root fruticose. *Stems* diffused, cespitose. *Leaves* crowded, oblong-linear, mucronate, glabrous. *Flowers* in axillary clusters. *Calyx-segments* scarcely mucronate.

(Chili); N. Patagon.

12. HERNIARIA L.

Flowers hermaphrodite or unisexual. *Calyx-tube* short, turbinate. *Style* very short, more or less deeply 2-parted. *Fruit* enclosed in the perianth-leaves.

Annuals or perennials, spreading-decumbent, branched herbs, with small, *sessile leaves*, and small, dry *stipules*, and small, green *flowers* in dense, axillary *clusters*, sessile or pediceled.

Species 15, in Mediterr. countries and Canaries.

HERNIARIA HIRSUTA L.

Prostrate, hirsute herb; *leaves* ovate-oblong; *glomerules* sessile, few-flowered.

(Europe); N. Patagon., by Rio Negro near Carmen.

13. ACANTHONYCHIA Rohrb. (*Pentacæna* Bartl.)

Small, cespitose, much branching herbs, with alternate, crowded, subulate-setaceous leaves, having large, acuminate, silvery stipules and inconspicuous sessile flowers. Calyx-segments ending in stout, rigid spines, or 2 of them smaller. Stamens 3–5, the filaments broad at base, with minute staminodes. Stigmas 2, sessile.

Species few, Chili to Mexico, and 1 in California.

A. RAMOSISSIMA Rohrb. (Weinm.) incl. *A. polycnemoides* (Rohrb.).

Stem diffuse, branching. Leaves crowded, terete, glabrous, their apex pungent. Flowers axillary, few. Fruit 1-seeded.

(Argent.); Patagon.; "on dry spots from Bahia Blanca to N. Patagon. and the foot of the Cordilleras. *Acne* of the Indians. Its infusion is used as a stomachic." J. Ball. By Golfo de San Jorge; Rio Gallegos; R. Sta. Cruz.

14. PHILIPPIELLA Speg.

Leaves glabrous, opposite, stipulate. Flowers apical, sessile, all alike. Calyx 4-cleft; the sepals decussate, imbricate. Staminodes 4, scale-like, opposite the sepals. Fertile stamens 4, alternate with the sepals. Ovary 1-celled, 1-ovuled. Fruit utriculariform, dehiscing irregularly. Seed suborbicular, compressed. Embryo annular.

Species only 1, viz.:

P. PATAGONICA Speg.

Botryose-ramulose, densely pulvinate. Leaves sessile, ovate-obtuse, fleshy, imbricating, 4-ranked. Stipules ovate, connate, obtuse, large. Flowers terminal on branches, bractless, green, glabrous. Stamens included, white. Style 2-lobed. Calyx persistent, not accrescent.

S. Patagon., by mouth of Rio Gallegos, and by Lago Argentino.

This plant when fresh is green and scentless; when dry it emits a strong scent like that of Valerian. (Speg.)

Family 38. CERATOPHYLLACEÆ. Hornwort Family.

Submerged herbs, with long, leafy branches, having whorled, finely dissected *leaves* with filiform segments, and monœcious *flowers*, solitary, sessile in the axils. *Perianth* single, many-parted. *Stamens* numerous, subsessile, extrorse, the connective prolonged. *Ovary* 1-celled, 1-seeded. *Style* 1, filiform.

The fertile and the sterile flowers are generally at different nodes, or at opposite sides of the same node.

One genus and 4 species, cosmopolitan, but not in arctic or antarctic regions.

CERATOPHYLLUM Linn.

Leaves spinulose-serrulate, forked. *Male flowers* with 10–20 stamens, anthers as long as the perianth. *Fruit* slightly exceeding the perianth, tipped by the persistent style.

C. AUSTRALE Griseb.

Lower *leaf-segments* narrow-linear, entire; upper linear-capillary, serrulate. *Achenes* shortly pedicelled, ellipsoid, tuberculate, narrowly repand-marginate, naked at the base. *Style* persisting, at length elongate. *Leaves* 3–4 cm. long.

N. Patagon., Rio Negro.

Family 39. RANUNCULACEÆ. Crowfoot Family.

Herbs, rarely climbing shrubs, with exstipulate leaves, alternate (except in *Clematis*), and regular or zygomorphous, complete, or sometimes apetalous flowers. Sepals 3–15, not united (in apetalous species mostly petaloid). Petals mostly as many, not united. Stamens numerous, they and the perianth-leaves all distinct and hypogynous. Carpels numerous, rarely 1 or few, nearly always distinct. Fruit having achenes or follicles. Embryo minute in large endosperm.

Species exceeding 1,000, most in Europe and N. Amer.; fewer in the tropics. All in the Patagonian Flora have regular flowers.

KEY TO THE GENERA.

A. Perianth single, its leaves petaloid.
  b. Fruit consisting of several follicles, each several-seeded. 1. *Caltha*, p. 399.
  b2. Fruit consisting of many 1-seeded achenes.
    c. Leaves alternate, but a 3-leaved involucre on the scape. 2. *Anemone*, p. 400.
    c2. Leaves opposite, and with no involucre. 3. *Clematis*, p. 401.
A2. Perianth usually double; its petals with a nectariferous pit below.
  b. Hermaphrodite.
    c. Minute annuals with linear leaves, and spurred sepals. Achenes in a spike. Scapes 1-flowered. 4. *Myosurus*, p. 402.
    c2. Stouter herbs, with spurless sepals, and mostly cymose flowers. Achenes in a head.
      d. Fruit with soft pericarp. 5. *Oxygraphis*, p. 403.
      d2. Fruit with firm or hard pericarp. 6. *Ranunculus*, p. 404.
  b2. Diœcious. 1-flowered male-scapes, and, 2-flowered female-scapes. Achenes in a head. 7. *Hamadryas*, p. 413.

1. CALTHA Linn. Marsh-marigold.

Leaves entire or crenate, mostly cordate. *Sepals* large, petaloid. *Petals* none. *Follicles* several or few, not united, with ovules on the ventral *suture*.

Species 10, in cold and temperate climates.

KEY TO THE SPECIES.

A. Leaves trifid, the intermediate division 2-lobed. *appendiculata*.
A2. Leaves entire.
  b. Leaf-margins ciliate. *dioneæfolia*.
  b2. Leaves ovate-sagittate. *sagittata*.

1. C. APPENDICULATA Pers. (DC. sub *Psychrophila*).

Cespitose, dioecious. *Sepals* 5, with a long, apical appendage, marcescent. *Scape* 1-flowered, very short, naked. *Leaves* radical, succulent, trifid, cuneiform. *Stamens* few. *Follicles* 5–9.

S. Patagon.; Magellan; Fuegia; alpine.

2. C. DIONEÆFOLIA Hook. f.

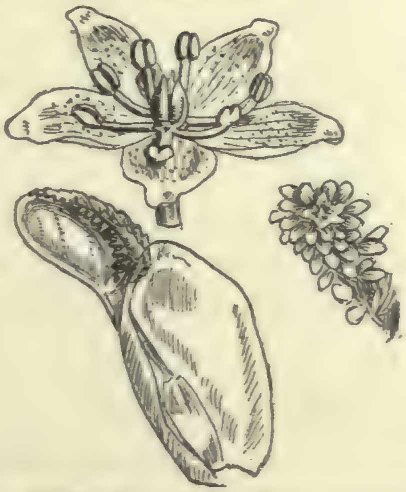
Leaves resembling in shape those of *Dionæa muscipula*.

Stamens 5–7. *Follicles* only 2–3.

"In green bosses upon which the stellate flowers have a very pretty appearance" (Fig. 66).

Common in South parts of Fuegia, and E. and W. Magellan; S. Staaten I.

FIG. 66.



Caltha dioneæfolia. Branch, about natural size; also magnified leaf and magnified flower. (After *Flora antarctica*.)

3. CALTHA SAGITTATA Cav.

Rhizome creeping. *Leaves* long-petioled, fleshy, sagittate, auriculate, inflexed upwards. *Sepals* 6–10, exceeding the 10 *stamens*. *Follicles* 25. (Allied to *C. palustris* L.).

(Chili); W. Patagon.; Magellan; over all Fuegia to Cape Horn; Falklands; by Rio Sta. Cruz to Lago Argentino. These are of a *latifoliar* form, having flowers on long, thick scapes, and suborbicular leaves. (Speg.)

2. ANEMONE Linn.

Erect, with an *involucre* of leaves on the stem, near to, or remote from the flower or flowers. *Petals* none. *Sepals* 4–20, petaloid. *Achenes* capitate.

Species 75, in temperate and cold climates.

KEY TO THE SPECIES.

A. Ovary glabrous.	
b. Involucre having 2–3 lobed or toothed leaves. (Chili.)	*antucensis.*
*b*2. Involucre having 3, much-divided leaves.	*hepaticæfolia.*
*A*2. Ovary very pubescent.	
b. Sepals 5; flowers 2–4.	*lanigera.*
*b*2. Sepals 5–8; flowers solitary, or 2–3.	
c. Radical leaves 3–5 partite; the lobes linear or cuneate.	*decapetala.*
*c*2. Radical leaves multipartite, with narrow lobes.	*multifida.*
*b*3. Sepals 10–12, leaves triternately divided.	*triternata.*

1. A. DECAPETALA Audouin.

Hairy or somewhat silky, 20–45 cm. high. *Root* tuberous. *Leaves* 3–5-partite; their segments linear or cuneate, incised or multifid. *Pedicels* 1–3, one naked, the others involucellate. *Sepals* 5–10. *Receptacle* globose, at length cylindraceous. *Achenes* woolly, with lateral, filiform style (Fig. 67).

(From the Arctic Circle by the E. U. S. and by the Rocky Mts. to Peru, Chile, Brazil, Argentina); Patagon., on pampas by Coy Inlet. (O. A. Peterson; by Rio Negro, near Carmen de Patagones. "In flower, Nov. 13, 1896, 'yellowish white.' Stems about 20 cm. high, and petioles somewhat woolly.")

A. DECAPETALA PATAGONICA O. Ktze.

Scape and *petioles* hirsute, with long, spreading hairs.

Chubut, and S. Patagon.

2. ANEMONE MULTIFIDA Poir. (Plate XXII.)

Radical *leaves* long-petioled, to 12 cm., reniform, 3–5-parted, the segments cut into narrow, acute lobes. *Fruit-head* woolly, cream-colored. *Styles* subulate. (= "*A. decapetala patagonica* O. Ktze.," fide Speg.)

Other parts are as *A. decapetala* in which J. D. Hooker included it. Our Patagonian specimens give *A. multifida* much taller (45 cm.), with longer petioles; and more silky except the petioles; root woody.

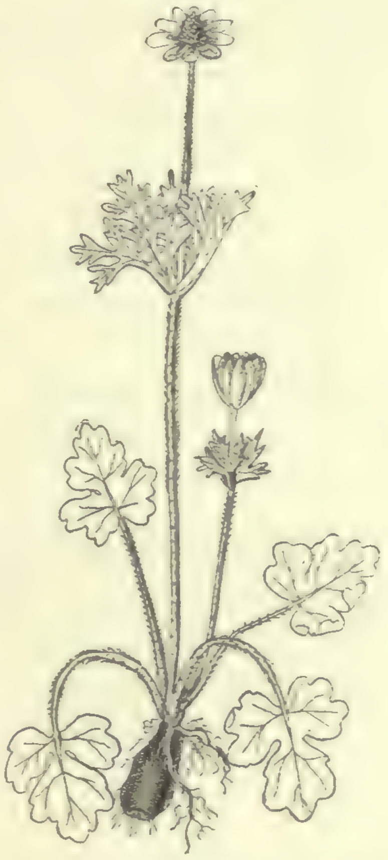
(Arctic Amer. and Rocky Mts.) Magellan; Fuegia, Ushuaia; S. Patagon., by Rio Sta. Cruz; (in fruit, Dec., J. B. Hatcher); Rio Ayley (Nov. 12, B. Brown); W. Patagon. by Rio Aysen (Dusén).

3. A. (?) MYRIOPHYLLA Speg.

Proteranthous, glabrous; radical *leaves* unknown. *Scape* thick, erect, 1-flowered; on its middle are 2 alternate, approximate, involucrate leaves, rather large, repeatedly trichotomous, having innumerable, small, fleshy, oblanceolate lobules. *Sepals* oblanceolate, mid-sized, glabrous. *Receptacle* obovate, densely papillate, glabrous. *Carpels* numerous, rather large, tetragonally winged, glabrous, with a short obtuse *style*. (The specimens were all in fruit.)

Patagonia, in rocky mountains near Lago Traful.

FIG. 67.



Anemone decapetala. Reduced to half-scale. (After Hooker and Arnott.)

4. A. TRITERNATA Vahl.

Leaves triternately divided on a branching petiole, the segments tridentate; *involucral leaves* sessile, cut into setaceous lobes. *Sepals* 10–12, oblong, obtuse. *Root* and habit of *A. decapetala*. *Fruit* woolly, in an oblong head.

(Argentina); Patagon. (?).

3. CLEMATIS Linn.

Suffruticose *climbers*, with opposite, slender-petioled, pinnate leaves, occasionally only lobed or entire. *Sepals* 4–5, valvate in the bud, petaloid.

Petals none. Stamens numerous. *Achenes* 1-seeded. *Styles* long, often plumose.

Species 100, chiefly in temperate climates.

C. VIRGINIANA Linn. (including *C. dioica* Linn.).

Flowers paniculate, dioecious. *Leaves* ternately divided, their segments subglabrous, ovate, subcordate, acuminate, 3-nerved, entire. Pericarps oval. *Pedicels* pubescent.

(Jamaica, medicinal.)

C. VIRGINIANA CAMPESTRIS (S. Hil.)

Cauline leaves flammuliform or bifoliate, or the upper simple: leaflets narrower-ovate to lanceolate, or narrower, mostly entire.

(S. Brazil to N. Patagon.) Common in shrubberies by Rio Negro, near Carmen, the form *angustissima* in Patagonia.

4. MYOSURUS Linn. Mousetail.

Diminutive, with fibrous root; basal, linear, entire *leaves*; and 1-flowered *scapes*. *Sepals* 5 (–6–7)-spurred at the base. *Petals* as many or none, greenish-yellow, narrow, with a nectary above the claw. *Stamens* 5–25. *Achenes* numerous, their receptacle elongate in fruit.

Species 5, Eurasia, western Amer.; Australia.

1. M. ARISTATUS Benth. (*M. apetala* Gay.)

With or without *petals*. *Fruit-head* at length long. *Achenes* carinate, beaked with a diverging, persistent *style*, nearly as long.

(W. United States to Chili and N. Zeal.) S. Patagon., pampas near Coy Inlet. By mouth of Rio Chubut (Dusén); by Rio Gallegos (Nordenskj.). In N. and E. Fuegia. "Is often petaliferous and occurs in N. Amer." A. Gray.

M. ARISTATUS BRACHYPUS (Speg.).

Leaves as long as the scape, or longer, numerous (10–20), broader and more acute than in *M. gracilis*. *Sepals* often 5; petals none. Stamens 5, all fertile.

Patagonia, in meadows by Golfo de San Jorge. Leaves 20 mm. long by 0.5 to 1.5 mm. broad.

2. MYOSURUS GRACILIS (Speg., var. of *M. aristatus*) Macl.
Plate XXI, M.

Diminutive and slender, 5–15 mm. high, with slender root, stem produced into 3–10 long, subsimple branches. Leaves few (4–8), the cotyledons persisting, all linear-oblong or spatulate, attenuate downwards, entire, obtuse, obscurely 1–3-nerved, glabrous, 5–20 mm. long by 0.5 mm. broad. Scape-like branches 1–3, erect, straight, exceeding the leaves, slender, glabrous and scarcely thickened above. Flowers small, ochroleucous. Sepals 3, green, linear-spatulate, erect, obtuse, 1-nerved, glabrous, spur two thirds as long. Petals 5, white, spatulate, attenuate downward, obtuse, 1-nerved, with 2 narrower staminodes. Stamens 3–5, two of them being sterile and petaloid, filaments as long as the petals.

Spike of achenes oblong, obtuse, less than 4 mm. long and two thirds mm. thick. Carpels rhombic-ovate on the back, tipped with a short, blunt, erect style, the pericarp very thin on the back, except a stout, opaque median line or ridge and a similar margin, the interveining part transparent and in maturity, showing the rather large seed, easily rupturing. Seed oval, sinuately rugulose.

Patagonia, by Rio Sta. Cruz and San Julian, near shrubberies. By Hatcher at Coy Inlet (showing the hypocotyl elongated above the roots). "Would make a new species," Spegazzini. Prof. Edward L. Greene, to whom we are indebted for the description of the fruit-head, states that "it is not at all nearly related to *M. aristatus;* it is a particularly well marked new species."

3. M. PATAGONICUS Speg.

Robust, cespitose. Leaves linear, peduncles thickened upwards. Sepals 5, with spur half their length. Petals none. Stamens 10. Carpels ventrally with capitate hairs. Fruiting spike elongated. Stylar mucro rather short.

Patagon.; in marshes by Golfo de San Jorge, and at La Plata Botanic Garden in soil from Rio Sta. Cruz.

5. OXYGRAPHIS Bunge.

Differing from *Myosurus* by having *seeds* erect, *petals* with a small basal nectary but spurless; from *Ranunculus* by having the achenes without a hard pericarp. *Sepals* mostly 5; and *petals* 5–12.

Species 9, Central Asia and N. Amer., and the following.

OXYGRAPHIS CYMBALARIA (Pursh, sub *Ranunculus*) Prantl.

Glabrous, scapose, spreading by long rooting *runners*. *Leaves* long-petioled, clustered at the nodes, round-cordate to reniform, crenate, fleshy. *Scapes* 1–7-flowered. (Fig. in Brit. & Br. ii, 86.)

(N. Amer.); Patagon., wet places near Rio Gallegos, Rio Chico, and Carmen de Patagones.

6. RANUNCULUS Linn. Crowfoot, Buttercup.

Herbs, with simple or variously divided, alternate leaves, and yellow or rarely white, regular flowers. Sepals mostly 5. Petals 5 or more with a pit or nectary at the base. Stamens numerous. Carpels numerous, not united, 1-ovuled. Achenes in a head or spike, each tipped by its style.

Species 200, in temperate and cold regions; also in Himalaya, and by Abyssinia to Madagascar and Mauritius; in Peru and Chili; thence to Patagon., and the Falklands.

KEY TO THE SPECIES.

A. Corolla white. Leaves floating or dissected. Petals 5–8.
  b. Upper leaves semiorbicular, lobed or wanting. Lower leaves filiformly dissected. Aquatics. *aquatilis*.
  b2. Leaves all semiorbicular, lobed. *biternatus*.
  b3. Leaves all submerged, capillary multifid. *fluitans*.
A2. Corolla white, but with yellow claws. Leaves reniform. Creeping scions. *hederaceus*.
A3. Corolla white to flesh-colored. Leaves 5-lobed, basally auricled. Cauline leaves narrow. Achenes smooth. *apiifolius*.
A4. Corolla yellow.
  b. Nectary abortive or foveolate. Leaves glabrous.
    c. Creeping. Flowers opposite to the tripartite leaves.
      d. Lateral leaf-segments orbicular, dentate; mid-segment bifid. *litoralis*.
      d2. Leaf-segments cuneate, 2–3-lobed; the lobes narrow, dentate. *montteanus*.
    c2. Creeping or ascending. Flowers axillary. Leaves entire or 3-parted.
      d. Sepals 3; petals 3. Leaves obovate-cuneate, apically 3-toothed. *trullifolius*.
      d2. Sepals 3; petals 5. Leaves linear, or broader, equally 3-lobed. *cæspitosus*.
      d3. Sepals deciduous; petals 5. Radical leaves orbicular, trisect and again trifid. *alboffii*.
      d4. Sepals reflexed; petals 4–6. Fleshy plant. *crassipes*.
      d5. Sepals and petals 5.
        e. Achenes numerous. Plant small. *minutus*.
        e2. Ripe achenes 15–18, turgid. Leaves cuneate, apically tridentate. *monanthos*.

*b*2. Nectary with a scale.
c. Leaves entire or dentate, smooth.
d. Flowers opposite the leaves.
e. Leaves orbicular, basi-cordate. *flagelliformis.*
*e*2. Leaves ovate, or lance-ovate (in Argentina). *bonariensis.*
*e*3. Leaves small, ovate, tridentate. *obtusatus.*
*d*2. Flowers axillary. Petals 7 or more.
e. Sepals 3. *uniflorus.*
*e*2. Sepals 5. Leaves fasciculate at the nodes, thick, ovate-elliptical. *bovei.*
*c*2. Leaves ternately parted, the divisions mostly stalked and pinnatifid. Sepals reflexed. Bulb. *bulbosus.*
*c*3. Leaves reniform to round-cordate, the upper 3-parted. Fruit-head rough with curved beaks. *muricatus.*
*c*4. Leaves all radical, subpeltate or obovate. Achenes 3–5, only 1 maturing, hooked. *oligocarpus.*
*c*5. Leaves palmately divided, hairy. Ovaries smooth.
d. Ovaries with 3 dorsal nerves.
e. Sepals 3; petals 8–10. *chilensis.*
*e*2. Sepals 3; petals 3 or none. *minutiflorus.*
*e*3. Sepals 5.
f. Petals 5, slightly exceeding the sepals. *valdivianus.*
*f*2. Petals 10–15, twice as long as the sepals. Radical leaves trifid, and again trilobate. Pedicels elongated. *peduncularis.*
*d*2. Ovaries with only 1 dorsal nerve. *savatieri.*
*A*5. Aquatics.
b. Leaves floating and submerged, not dissected. Peduncles long, emerging. *fuegianus.*
*b*2. Leaves floating, entire, in fascicles of 2 or 3. Flowers axillary, yellow, small. *hydrophilus.*
*b*3. Stout with rooting flagella, having long-stalked, subpeltate leaves and solitary flowers. *potamogetonoides.*
*A*6. Nearly stemless.
b. Leaves erect, long-petioled, reniform-rotundate, 3-lobed and toothed. Sepals villous. *maclovianus.*
*b*2. Radical leaves stellately spreading, round-reniform, cleft, covered with yellow silk. *sericocephalus.*
*A*7. Radical leaves long-petiolate, 3-cleft, and the segments 3–5-lobed; the lobes gland-tipped. *glanduliferus.*
*A*8. Erect. Radical leaves 3-lobed; the segments 3-cleft, etc. Stem simple, 1-flowered and naked, or 2-flowered with bracts. *patagonicus.*

1. RANUNCULUS ALBOFFII Macl. (Alboff *sine nomine*).

Rhizome fibrilliferous. *Stem* erect, 30 cm. high, its apex blackish, forking, 2-flowered. *Leaves* pubescent; the radical leaves long-petioled, orbicular, trisect, their segments obovate-cuneate, trifid, the terminal subsegment trisect, between a bisect pair; cauline leaf solitary in the fork, 3-partite. *Sepals* deciduous, reflex, yellowish. *Petals* 5, golden, obovate, unguiculate. *Achenes* in a globular head, glabrous, with short hooked styles.

Fuegia, above Ushuaia at 300–400 m. elevation. (Alboff.)

2. RANUNCULUS APIIFOLIUS Pers.

Stems erect, glabrous, fistulous, green, branching. *Leaves* radical and cauline, petiolate, glabrous, shining; lower leaves 5-lobed, the lobes sinuate-serrate; the petioles basally auricled-sheathing; upper leaves sublinear. *Peduncles* axillary, involucrate by 2 opposite, sessile, linear-lanceolate bracts, 3 in each involucre, the mid one larger and 1-flowered; the side ones 2-bracted. *Flowers* white to flesh-colored. *Stamens* numerous, filaments white, anthers yellow. *Achenes* obovate, smooth, easily deciduous.

Patagon., "in swamps through the whole republic."

3. R. AQUATILIS Linn. Common Water-Crowfoot.

Leaves of two kinds, some floating and flat, 3-lobed or 3-parted (sometimes wanting), others immersed and multifid with capillary divisions. *Petals* white, nectary without a scale. *Achenes* transversely rugose.

(Temperate Eurasia, Australia); Patagon., Chubut, in subandine pools.

R. AQUATILIS CÆSPITOSUS DC.

Leaves petiolate, all emersed, their outline suborbiculate, cut into divergent segments. *Pedicel* scarcely exceeding the petioles. *Achenes* obovate, rugose.

S. Patagon., in wet places near Rio Sta. Cruz, and at Orr-aike, near Lago Viedma.

R. AQUATILIS CAPILLACEUS DC.

Leaves petiolate, all immersed, divided into filiform segments.

Chubut, in slowly flowing waters near Carren-leofú.

4. R. BITERNATUS Smith.

Small herb, with many slender *stems* from a fibrous root, creeping and glabrous. *Leaves* biternately dissected, the lobes oblong, acute, entire or toothed. *Flowers* solitary, the petals white, oblong, sometimes long-clawed, equalling the sepals. *Head* of achenes smooth, globular, rather large, at length ruddy.

E. and W. Magellan, Fuegia, Navarino I., Falklands.

R. biternatus exiguus is a small state, common in the Falklands.

5. RANUNCULUS BOVEI Speg.

(Of sec. *Ranunculastrum*, having achene with 1 dorsal nerve, floral axis long, nectary with free scale, root fleshy.)

Glabrous. *Stems* stoloniferous, thickish. *Leaves* at the nodes 3–5-fasciculate, their petiole very long, erect, their limb thick, ovate or elliptical, base rounded, apex rounded or obtusely pointed. *Flower* solitary on an erect scape, as long as the petioles. *Sepals* 5, ovate. *Petals* many, narrow, obovate, as long as the sepals. *Achenes* obovate, obscurely tetragonal. *Style* short, lateral. Handsome.

Punta Arenas. S. Patagon., Gallegos Valley (Nordenskj.); N. and E. Fuegia (Dusén).

6. R. BULBOSUS Linn. Bulbous Crowfoot.

Perennial, with bulbous *root*, upright, many-flowered *stem*, *leaves* divided into 3 stalked leaflets, which are again 3-parted and lobed. *Peduncles* furrowed, *sepals* reflexed, and glabrous *achenes* in a globose head.

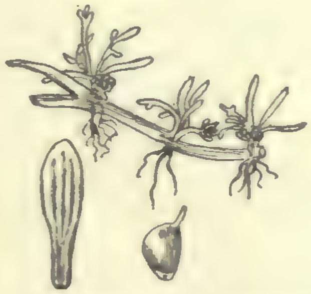
(Eur. and U. S.); common in grassy places by Rio Negro. N. Patagon.

7. R. CÆSPITOSUS Dusén.

Cespitose, glabrous, creeping. *Stem* thick, rooting at the nodes, fasciculately leafy, 1-flowered. *Leaves* long petioled, or linear, entire, or cuneiform-dilated towards the apex, 3-lobed. *Flowers* small, yellow, sessile or nearly so. *Sepals* 3, broad, fugacious. *Petals* twice as long, 5, with saccate nectary. *Stamens* rather few. *Achenes* 20–30, in a globose head. *Style* nearly as long as the achene (Fig. 68).

S. Fuegia, in swamps near Rio Azopardo.

FIG. 68.



Ranunculus cæspitosus. Natural size; also enlarged petal and carpel. (After Dusén.)

8. RANUNCULUS CHILENSIS DC.

Procumbent *stems* and petioles hispid. *Leaves* subvillous, cordate-orbicular, 3–5-cleft, the lobes coarsely toothed; the upper leaves smaller. *Flowers* small, 6–8 mm. diam., sometimes larger. *Calyx* very villous. *Achenes* orbicular-compressed, smooth-margined.

Cape Tres Montes, and Chonos Archip.; Rio Sta. Cruz (C. Darwin); Ushuaia (Hahn); Magellan (Hatcher).

9. R. CRASSIPES Hook. f.

Glabrous, fleshy, with creeping *stem*. *Leaves* long-petiolate, cordate-reniform, trifid or tripartite, with the segments 3–5-crenate. *Peduncles* shorter than the petioles. *Sepals* at length reflexed. *Petals* 4–6, obovate-spatulate, yellow. *Achenes* turgid; styles straight.

Allied to *R. biternatus*. In Kerguelen I., in moist places. A specimen in the Gray Herbarium, collected by R. O. Cunningham at Punta Arenas, Magellan, is intermediate between the two species.

10. R. FLAGELLIFORMIS Smith.

Flowers yellow; *leaves* undivided, long-petiolate, orbiculate-cordate, entire, glabrous. *Stem* repent; pedicels oppositifoliose. *Carpels* small, ovate, muticous, smooth or subpunctulate.

(Chili and New Granada); N. Patagon., abundant in flooded places near Carmen de Patagones.

10. R. FLUITANS Lam. River-Crowfoot.

(*Batrachium.*) *Flowers* small, white, without a scale at the base of the petals. *Leaves* all submersed, capillaceo-multifid, their segments long and parallel. *Petals* ovate, exceeding the sepals. *Achenes* transversely wrinkled.

(Eur.)

R. FLUITANS MINOR Gelert.

E. Fuegia (Br. Ansorge).

11. R. FUEGIANUS Speg.

Glabrous. *Stems* diffuse, floating, leaves uniform, the submersed not dissected. The lower *leaves* discoid or ovate in contour, basicordate, deeply 3–5-cleft, their lobes obtusely 3–5-lobed and incised; upper trifid lobes spatulate, entire or toothed. *Petiole* thick, long. *Peduncles* long, emerging from the water, 1–3-flowered. *Flowers* small. *Sepals* broad, ovate, glabrous.

S. Patagon., Magellan; E. & S. Fuegia. (Robust form, with rather long petals, by Rio Chico, etc.)

(*R. fueginus* Phil. Small, silky, with 3-partite leaves, the lateral lobules bifid and toothed; the mid-lobule 3-toothed. Fruit globular. Fuegia. "Classification doubtful." C. Reiche.)

12. RANUNCULUS GLANDULIFERUS Poeppig.

Little branching, and sparingly hirtellous. *Radical leaves* long-petiolate, rounded, subcordate, or truncate or cuneate at the base; 3-cleft beyond the middle, the segments with 3–5 linear lobes, gland-tipped. *Cauline leaves* few, with narrow segments. *Peduncle* long, with red appressed hairs, especially above. *Sepals* 5, subpetaloid-yellowish, pilose externally, ovate. *Petals* twice as long, narrower, nervose. *Achenes* ovate, glabrous; *style* nearly as long.

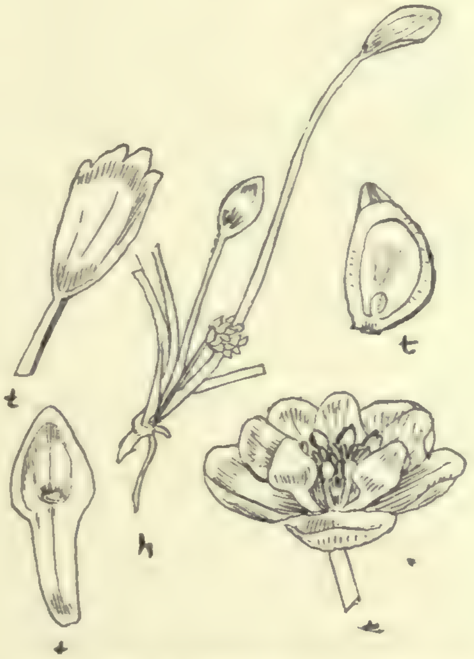
(S. Chili.) Patagon., in grassy plains near Pozo-huapi. (Speg.)

13. R. HEDERACEUS Linn.

Glabrous, with long creeping *scions*, rooting at the nodes in moist places. *Leaves* reniform, 3–5-lobed, on petioles 1–10 cm. long. *Pedicels* solitary, 1-flowered; the *petals* white, with yellow claws. *Stamens* 5–10. *Style* short, thick.

Magellan, Port Gregory. (Safford.)

FIG. 69.



Ranunculus hydrophilus (*h*); and enlarged leaf, petal, flower, and section of fruit of *R. trullifolius* (*t*). (After *Flora antarctica.*)

14. R. HYDROPHILUS Gaud.

Glabrous. *Stem* slender, creeping. *Leaves* long-petioled, swimming, elliptic-ovate, entire, 3–5-nerved; in fascicles of 2–3, sheathing at the base. *Peduncles* axillary, solitary, shorter than the petioles. *Flowers* small;

the *petals* yellow, spatulate. *Achenes* few; *styles* very short. (Fig. 69, central figure, *h.*)

(Leaves like floating leaves of *Potamogeton heterophyllus.*)

S. Fuegia (Dusén); Punta Arenas (R. O. Cunningham); Falklands in fresh water.

15. RANUNCULUS MACLOVIANUS d'Urv.

Nearly *stemless*, appressed-pilose, the radical *leaves* long-petiolate, erect, reniform-rotundate, trifid or trilobate, the segments coarsely and acutely toothed; *peduncles* shorter than the leaves, rising from young branchlets. *Sepals* villous. *Petals* spatulate, longer than the sepals, yellow. *Achenial* head globose, rather glabrous; *styles* short, hooked.

Falklands, abundant in moist places.

16. R. MONTTEANUS Phil.

Glabrous. *Stem* creeping. Leaves long-petioled, 3-partite, the segments trifid; the subsegments incised mostly into linear pieces. *Peduncles* solitary, axillary, equalling the petioles. *Sepals* 5, ovate-oblong. *Petals* equalling them, oblong, yellow. *Achenes* inflated, in a globose head, smooth; *styles* as long as their achenes, incurved.

Chonos Archip.

17. R. MURICATUS LINN. Spiny-fruited Crowfoot.

Subglabrous, branched, 30–60 cm. high. *Lower leaves* reniform to round-cordate, on broad petioles, lobed, or crenate; *upper* 3-parted, cuneate, subsessile. *Flowers* yellow; *petals* exceeding sepals. *Fruit-head* globular, *achenes* compressed, with curved *beak.*

(Old World; naturalized in Amer.); N. Patagon., in fields near Carmen.

18. R. OLIGOCARPUS Speg.

(*Hecatonia.*) Glabrous; *root* densely hairy. *Leaves* all radical and subpeltate; petioles very long, limbs suborbicular or obovate, obtuse, entire or 3-crenate, rather fleshy. Scapes erect, half as long as the petioles, sheathed and 1-leaved at apex, with 1–2, 1-flowered pedicels. *Flowers* small, yellow, *sepals* ovate, *petals* linear; *stamens* numerous; *carpels* 3–5, only 1 maturing, with hooked *style.*

Chubut, wet places along Rio Carren-leofú. Like *R. trullifolius*, but distinguished by the subpeltate leaves (as *R. potamogetonoides* Speg. and *R. bonariensis* Poir.)

19. RANUNCULUS PATAGONICUS Smith.

Appressed-pilose. *Stem* erect, simple, 1-flowered, naked; or 2-flowered and then involucrate. *Leaves* radical, 3-lobed, their segments cuneate, 3-cleft, incised. Involucre 1-leaved, 3-cleft. *Petals* 10–12, exceeding the spreading sepals. *Achenes* glabrous. Style hooked.

Chili. Patagonia (?).

20. R. PEDUNCULARIS Smith.

Leaves subglabrous, radical, long-petiolate, 3-partite; their segments 3-lobate, apically acute and incised, the subsegments narrow. *Cauline leaves* 1–2, linear or trifid. *Stem* erect, bearing 1 leaf and 1–2 flowers. *Sepals* ultimately reflexed. *Petals* 8–10, oblong, clear yellow. *Achenes* globose, smooth; *styles* hooked.

(Chili, on the Pacific slope); Cabo Negro, Magellan, by Hatcher at Punta Arenas, E. and S. Fuegia (Dusén), "stems with sparse appressed pilescence"; Chubut, near Rio de Mayo.

R. PEDUNCULARIS ALBOFFIANUS Speg.

Tall specimens with *bracted* 2–3-flowered *scapes*, mostly appressed-setulose.

S. Patagon. in grassy places at Orr-aike, near Lago Viedma.

R. PEDUNCULARIS MINOR Weddell. Appressed-pilose, 5 cm. high. *Peduncle* basal, 1-flowered. Punta Arenas. (Hahn.)

R. PEDUNCULARIS PATAGONICUS Poepp. (*R. patagonicus* Poepp. non Smith.)

Stem erect, appressed-pilose, simple, naked, 1-flowered, or involucrate and 2-flowered. *Leaves* radical, 3-lobed; their segments cuneate, trifid, incised. *Involucre* 1-leaved, trifid. *Petals* 10–12, exceeding the spreading sepals. *Carpels* glabrous. *Styles* uncinate.

(Chili); Magellan. (Dusén.)

R. PEDUNCULARIS POLYPETALUS.

Lower, 1-flowered. *Leaves* nearly pinnate; scape 1-leaved.

21. RANUNCULUS POTAMOGETONOIDES Speg.

Stout, glabrous, flagelliferous, the flagella rooting, their apex fasciculate-leafy; the *leaves* long-petiolate, entire, subpeltate, orbicular-ovate, obtuse, the base rounded-subcordate, narrowly peltate-marginate. *Flowers* solitary, peduncles shorter than the leaves. *Achenes* in a globose head, numerous, elliptico-obovate, longitudinally striate.

Rio Sta. Cruz, in flowing water at Orr-aike.

22. R. SAVATIERI Franch.

Stiffly pilose. *Stems* 60–90 cm. long, prostrate, bearing at the nodes a fascicle of leaves or branchlets. *Leaves* long-petioled, reniform-cordate, trisect, the segments obovate-cuneiform, 3–5-lobed. *Peduncles* 25 mm. long, slender, from the nodes. *Flowers* scarcely 4 mm. diameter: *sepals* broad-ovate; *petals* as long, narrow. *Achenes* 1.5 mm., dorsally subacute, ovate-rounded; *style* infra-apical, slightly incurved.

Patagon., at Punta Arenas.

23. R. SERICOCEPHALUS Hook. f.

Depressed, stemless; densely covered by yellow, silky *hairs*. *Leaves* radical, stellately spreading, round-reniform, irregularly 3–7-cleft, their lobes coarsely crenate-toothed. *Peduncles* very short; *flowers* small, inconspicuous. *Petals* narrow, spatulate, yellow. *Achenes* silky; *style* hooked.

Falklands, Fuegia, at Ushuaia; here caulescent and larger.

24. R. TRULLIFOLIUS Hook. f.

Glabrous. *Stem* short, sarmentose. *Leaves* radical, obovate-cuneate, entire, apically 3–5-toothed; *petioles* long, thick, attenuate upwards. *Peduncles* shorter than the petiole. *Flowers* inconspicuous. *Sepals* broad-ovate-rounded. *Petals* shorter. Achenes large (*t-t*, Fig. 69, p. 409).

(Kerguelen); Falklands, in freshwater; Magellan, E. and S. Fuegia; not rare by streams near Punta Arenas.

7. HAMADRYAS Comm.

Diœcious, the scape bearing one male, or two female flowers, with rudiments of suppressed organs. Low herbs from perennial caudex, with silky *leaves.* *Sepals* 5–6. *Petals* 10–12, with basal scale, showy. *Achenes* numerous, in heads, with short, hooked *styles.*

Species 6, all Neantarctic.

KEY TO THE SPECIES.

A. Leaf solitary, tripinnate, and flower solitary.	*delphinium.*
A2. Leaves rounded.	
b. Leaves 5–7-cleft, webby.	*kingii.*
b2. Leaves tripartite, or also further divided.	*magellanica.*
A3. Leaves subovate or narrower.	
b. Leaves deeply trifid, and again cleft, silvery.	*argentea.*
b2. Leaves oblong or subtrifid, webby.	*tomentosa.*
A4. Leaves imbricate, appressed, from a broad base, forming a column around the scape and solitary flower. Scions.	*sempervivoides.*

1. HAMADRYAS ARGENTEA Hook. f.

Leaves silvery-woolly, obovate-cuneate, attenuate at the base, deeply trifid, the lobes also 3–5-cleft. *Male plant* smaller than the female.

Falklands; Magellan.

2. H. DELPHINIUM.

Having one *leaf* and one *flower*; *leaf* oblong-tripinnate, tomentose, 10 cm. high. *Sepals* 5, villous. *Petals* 12, narrower.

Magellan.

3. H. KINGII Hook. f.

Leaves rounded, 5–7-cleft, or many-lobed, the lobes crenate; cobwebby on both sides.

S. Patagon.; Magellan.

4. H. MAGELLANICA Lam.

Leaves silky, at length glabrous, rounded, tripartite; the segments cuneate, incise-partite or subentire. *Flowers* spicate. *Calyx-segments* concave, glabrous or villous-tipped. *Petals* linear, mucronate. *Style* of young achenes hooked, at length straight.

Magellan, Fuegia; Staaten. S. Patagon., near Rio Gallegos at 900 m. elevation (Nordenskj.). Cordilleras above Rio Chico (Hatcher).

A variety has the leaves silvery-woolly.

5. HAMADRYAS SEMPERVIVOIDES Sprague. (Plate XVI.)

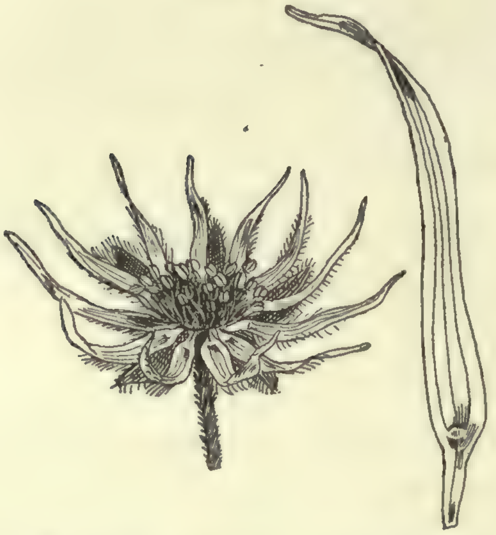
Differs from the other species by rosulate habit and glabrous sepals and petals.

Rootlets fibrous, thick, adventitious. *Stem* simple or bifid, 25–37 mm. long, clothed below by the leaf-bases. *Leaves* sessile, rosulate, sheathing the stem; limb twice trisect, 4–5 mm. long, the mid-segment external, the laciniæ oblong, cuspidate, glabrous; sheath 10–12 mm. long, 7–8 mm. broad, scariose, spongiose upwards, woolly externally. *Scape* concealed by leaves, 16 mm. long, 1-flowered. *Male flowers* unknown. *Female flowers; sepals* 5–6, deltoid-subulate, 3 mm. long, 1–1.5 mm. broad, scariose; *petals* about 7, linear-subulate, 8 mm. long, with a nectariferous callus above the base. *Ovaries* ovate, attenuate above to an uncinate style. *Achenes* posteriorly produced at the base.

S. Patagon., on lava rocks in Cordilleras, J. B. Hatcher, Feb. 1897.

"A most distinct species showing typical adaptation to high mountain conditions." T. A. Sprague, in Hooker's *Icones Plantarum*, vol. viii, part ii, May, 1902. (Plate 2748.)[1]

FIG. 70.



Hamadryas tomentosa. Staminate flower and one of its petals both magnified. (After *Flora antarctica.*)

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[1] (This interesting specimen was sent by us to Kew Herbarium, where it was recognized as a new species, and described and published in the *Icones Plantarum.*)

Diagnosis (issued in advance in Hooker's *Icones Plantarum*, plate 2748, May, 1902.)

HAMADRYAS SEMPERVIVOIDES Sprague (sp. nov.); a certeris speciebus differt habitu rosulato, sepalis petalisque glabris.

Radicelli fibrosi, crassi, adventitii. *Caulis* simplex vel bifidus, 1–1.5 poll. longus, subtus foliorum basibus vestitus. *Folia* sessilia, rosulata, caulem vaginantia; lamina bis trisecta, 2–2.5 lin. longa, segmento medio exteriore, laciniis oblongis, cuspidatis, glabris; vagina 5–6 lin. longa, 3.5–4 lin. lata, scariosa, superne spongiosa, extus lanata. *Scapus* foliis occultus, 8 lin. longus, 1-florus. *Flores masculos* non vidi. *Flores feminei:* sepala 5–6 deltoideo-subulata, 1.5 lin. longa, 5–.75 lin. lata, scariosa; petala circa 7, lineari-subulata, 4 lin. longa, supra basin collo nectarifero instructa. *Ovaria* ovata, superne in stylum uncinatum attenuata. Achænia basi postice producta.

6. Hamadryas tomentosa DC. (*H. magellanica tomentosa.*)

Erect. *Leaves* oblong or subtrifid, webby-villous on upper surface. *Stems* covered by fibrous threads from old leaves. *Calyx* tomentose. *Capsules* oval, ending in a persistent style, striate. (Fig. 70, p. 414.)

Fuegia, Mts. above Ushuaia; Staaten I; rare.

Family 40. BERBERIDACEÆ. Barberry Family.

Shrubs or herbs with alternate or basal *leaves*, and regular flowers. *Sepals* and *petals* two- to several-seriate. *Stamens* as many as, and opposite to the petals, hypogynous; *anthers* mostly opening by valves. *Pistil* of 1 carpel; *fruit* a berry or capsule.

Species more than 100, most of them in the N. Temperate zone, the Andes, and in temperate S. Amer.

BERBERIS Linn. Barberry.

Shrubs with simple or pinnate *leaves*, often spiny-toothed, or changed into spines. *Sepals* 6–9, petaloid; *petals* and *stamens* usually 6 each, the *anthers* opening by upwardly opening valves. *Ovary* 1-celled. *Fruit* a berry. Species 100.

Key to the Species (including some Chilian forms).

A. Flowers in corymbs or racemes.		
b. Stamens appendaged below the anthers. Spines palmately divided.		
c. Lower leaves spiny-toothed.	*congestiflora.*	(Chilian).
c2. Leaves all entire. Racemes.	*rotundifolia.*	
c3. Leaves entire. Umbels.	*umbellata.*	
b2. Stamens not appendaged.		
c. Branches (some or all) spineless.		
d. Leaves, some membranous, entire, others coriaceous, spiny-toothed.	*polymorpha* (Chilian).	
d2. Leaves coriaceous.		
e. Leaves lanceolate, dentate.	*pearcei.*	
e2. Leaves obovate, basally attenuate.	*serrato-dentata.*	(Chilian).
c2. Branches with spines.		
d. Leaves, some entire, others spiny-toothed.	*polymorpha.*	
d2. Leaves with bidentate margins.	*bidentata.*	
d3. Leaves spiny-toothed.		
e. Spines short, 5 mm.		
f. Rachis of raceme shorter than the leaves.	*ilicifolia.*	
f2. Rachis longer than the leaves.	*darwinii.*	

e2. Spines more or less elongated. Leaves slightly toothed. *valdiviana* (Chilian).

b3. Flowers large, 5-merous. Spines 3-partite. Leaves oblong, coriaceous. *ruscifolia.*

A.2. Peduncles 1-flowered, solitary, or aggregate.
  b. Stamens without appendages below the anther.
    c. Leaves oval, or obovate. (*buxifolia*) *microphylla.*
    c2. Leaves lanceolate or linear-lanceolate. *grisebachii.*
  b2. Stamens appendaged below the anther.
    c. Leaves entire, linear; flowers 1(–2). *empetrifolia.*
    c2. Leaves, some angular spiny-toothed, others entire. Flowers solitary. *heterophylla.*
    c3. Leaves cuneate, tridentate. Flowers solitary. *cuneata.*
  b3. Spineless. Leaves entire, elliptical. Berries ovate. *inermis.*
  b4. Leaves entire or spiny-toothed, obovate. Berries small. Branching virgate. *virgata.*

A3. Flowers? Heterophyllous, with 3–5-partite spines. Upper leaves sessile. Branches slender. *darwinii.*

1. BERBERIS CUNEATA DC. Califate.

Low shrub. *Spines* 3-parted, scarcely longer than the leaves. *Leaves* obovate-cuneate, spinosely trifid, smooth. *Pedicels* solitary, 1-flowered, nearly as long as the leaves. *Flowers* as large as in *B. vulgaris*. *Berries* intensely purple, as large as peas, not sweet.

S. Patagon., Porto Deseado; near Coy Inlet. (Hatcher. It is called "califate," grows everywhere, and its wood is invaluable for fuel.)

2. B. DARWINII Hook (including *B. morenonis* O. Ktze.).

Young branches rusty-pubescent. *Leaves* rigidly coriaceous, shining, rusty below, cuneate or oval, trifid at apex; their margin spinose-toothed. *Racemes* exceeding the leaves, sometimes long, slender. *Berries* subglobose, not pleasant.

(Chili); Patagon., in mountain shrubberies near Carren-leofú.

3. B. EMPETRIFOLIA Lam.

Small shrub, with reddish brown pubescent *bark*. *Spines* 3-parted. *Leaves* evergreen, linear, entire, revolute, clustered. *Pedicels* 1–2, from branchlets between the leaves, each 1-flowered. *Stigma* subsessile. *Berry* globose, bluish-black, slightly sour.

Chili, in woods on cordilleras, descending to sea-level at Magellan. A steppe-plant. In N., E. and S. Fuegia. (Dusén.)

4. BERBERIS GRISEBACHII Lechl. (*B. linearifolia* Phil.).

Spines rather short, 3-branched, branches divaricate, equal. *Leaves* linear, margins revolute, apex mucronate; 36 mm. by 5 mm. *Peduncles* 1-flowered, as long as the leaf. *Fruit* ovate, blue, terminated by a long *style.*

(Chili); Patagon.: Magellan.

5. B. HETEROPHYLLA Juss.

Bush, 150 cm. high, with wrinkled *bark*, dark on old, brown on young parts. *Spines* 3-parted. *Leaves* fascicled, sessile, glabrous, oblanceolate, entire, some with 3 pungent teeth. *Pedicels* solitary, 1-flowered, scarcely exceeding the leaves. *Petals* with basal glands, deep yellow-orange. *Filaments* toothed. *Berries* black, with sessile stigma, edible.

Magellan northwards to Rio Negro; not in S. Fuegia. By Hatcher at Coy Inlet. The S. Amer. ostrich (*Rhea darwinii* Gould) is fond of its berries. Native name of the shrub, Gayankhia; of the berries Khalgo; the shrub is also called Califate).

6. B. ILICIFOLIA Forst.

Erect *evergreen* shrub, to 1 m. high, with light-colored bark. *Spines* tripartite. *Leaves* shining, obovate, coarsely spinose-toothed in the upper part. *Peduncles* shorter than the leaves, 4–6-flowered; pedicels long, subcorymbose. *Flowers* rather large, flame-colored, crowded near the top of young shoots. *Berries* ovoid, blue, not edible.

S. W. Patagon.; E. and W. Magellan and through Fuegia to Cape Horn. By Hatcher at Lapataia. Handsome with the moss, *Ulota fulvella* Mitt., on its stem. Its leaves resemble holly-leaves. Fuegian name "Tchelia."

7. B. INERMIS Pers.

Spineless. Leaves elliptical, entire, smooth, scarcely mucronulate. *Pedicels* solitary, 1-flowered, exceeding the leaves. *Berries* ovate, crowned by the stigma.

Magellan.

8. B. MICROPHYLLA Forst., 1787. (*B. buxifolia* Lam. 1791; *B. dulcis* Sweet, 1831.)

Erect *evergreen* shrub, with stout, 3-partite *spines*, longer than the leaves. *Leaves* oblong-lanceolate or ovate, large in the young plant, petiolate, pungent, here and there spiny-toothed; in older plants smaller, 12 mm. long, usually entire, acute, at length coriaceous. *Pedicels* 1–3-flowered. *Berry* flat-globose, 4-seeded, blue-black, edible.

It forms dense bushes, with leafage of boxwood. The young leaves often have the cluster-cups of the fungus, *Æcidium magellanicum.*

E. and W. Magellan; Fuegia, nearly everywhere; but rare in the rainy-wood-region. (Dusén.) By Hatcher in the Cordilleras of S. Patagon.; scarcely any of these have the leaves spiny-toothed, except the apical spine. "The berries were used for tarts by the officers of the Beagle, and were found to be excellent, called *Magellan-grapes.*" (J. D. Hooker.) Near Lago Nahuel-huapi (leaves larger and thickish).

9. BERBERIS MICROPHYLLA GRACILIS Alboff.

Branches long, slender, pendulous. *Leaves* membranaceous (not coriaceous), ovate-lanceolate, obtuse. *Flowers* mostly in 3's; *peduncle* 1 cm., short.

Fuegia, at Ushuaia.

(*B. morenonis* O. Ktze. is only a young condition of *B. darwinii* Hook., fide Speg.)

10. B. PEARCEI Phil.

Leaves short; petiolate, oblong, coriaceous, spinosely serrate, mucronate, the under surface glaucescent to rufescent, glabrous, reticulate-veiny. *Racemes* 6–10-flowered, scarcely equalling the leaf. *Pedicels* 10–15, slender, smooth. *Style* short, *stigma* peltate. *Fruit* 6–7 mm. by 5 mm. blackish with a glaucescent bloom; *pedicel* 10–15 mm. slender, smooth. (Differs from *B. ilicifolia* by the numerous teeth of the leaves.)

Patagon., Chubut, in subandine woods; Valdivian Andes.

11. B. RUSCIFOLIA Lam.

Shrub 1–2 m. high. *Spines* 3-parted. *Leaves* simple, coriaceous, shining, oblong, tapering at the base, mucronate, entire, or coarsely and spiny few-toothed, 4 cm. long. *Peduncles* short, bearing 4–7 flowers in a terminal *raceme.* *Flowers* large, 15 mm. broad, with 5 *sepals* and 5 *petals.*

(Buenos Aires); Punta Arenas, Hatcher.

12. B. VIRGATA Ruiz & Pav. (Plate XV.)

Erect, much branched shrub. *Spines* small or none. *Leaves* obovate, entire, or spinously toothed towards the apex, smooth.

Peduncle solitary, 1-flowered, as long as the leaves. *Berries* small, oblong-ovoid.

(Peru in woods); by Hatcher in the Cordilleras of S. Patagon., in flower Feb. 17, 1897. "Bush, 60–90 cm., white." In Hatcher's specimens I cannot find the anther valves developed; they are only indicated by a specialization of cells at the place of origin. (Macl.)

Family 41. MAGNOLIACEÆ.

Trees or shrubs with alternate *leaves* and large flowers; the *sepals* and *petals* in cycles. *Stamens* numerous, hypogynous. *Carpels* many, not united, becoming dry or fleshy mericarps. Embryo minute, in non-ruminate endosperm.

Species 70, chiefly in Himalaya, E. Asia, and E. part of N. Amer.

The subfamily *Illicieæ* which contains *Drimys*, has the flowers often polygamous, not 3-merous, the carpels 1-seriate or solitary, and the leaves exstipulate, finely dotted.

DRIMYS Forst. Winter's-bark.

Carpels crowded, baccate, many-seeded. *Staminal* filaments thickened upwards, bearing distinct anther-cells.

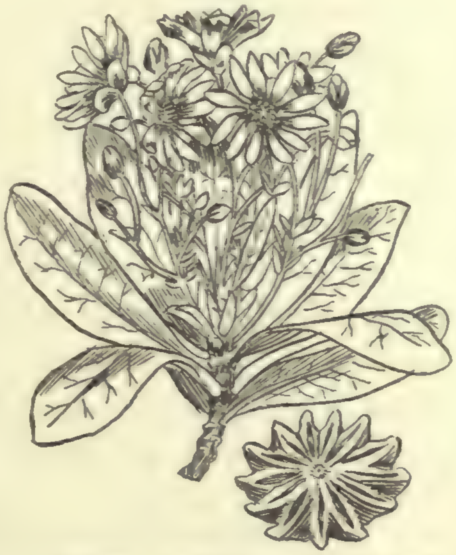
A small genus, with species in Australia, New Zealand, New Guinea, Borneo, Mexico, Venezuela, and Chili, to Fuegia.

D. WINTERI Forst.

Tree, with evergreen leaves; *leaves* 7–10 cm. long, oblong or ovate-lanceolate, obtuse, glaucous beneath. *Peduncles* subsimple, *aggregate*, or very short, ending in long *pedicels*. (Fig. 71.)

E. and W. Magellan, in woods near Punta Arenas and westwards. Fuegia, about Lapataia (not at Ushuaia); abounding in the rainwoods; in Navarino, and Staaten I. Native name, "Ouchkouta," for the wood; "Liouch," for the leaves. Its

FIG. 71.



Drimys winteri, Winter's-bark. Flowering branch, reduced; also fruit. (After Prantl.)

English name is after Capt. Winter, who accompanied Sir Francis Drake in his circumnavigation of the globe, 1577–80. Its bark was used as medicine against scurvy, and also as a condiment. A noble tree, with smooth, gray bark, leaves like laurel-leaves, and masses of rather large, white flowers in cymes terminating the branches.

DRIMYS WINTERI CHILENSIS (DC.).

Leaves oblong-obovate, glaucous underneath.
(Chili); S. Patagon., near Ultima Esperanza.

D. WINTERI MAGELLANICA Eichl.

Leaves shorter and broader, half as broad as long.
Magellan.

D. WINTERI MORENONIS O. Ktze.

Leaves very many, oblanceolate. *Peduncles* mostly 1-flowered.
Patagonia.

Family 42. MONIMIACEÆ.

Trees or shrubs with *exstipulate*, mostly opposite pinnately nerved *leaves;* and mostly unisexual *apetalous flowers*, with several-seriate *sepals*, the inner being partly petaloid. *Stamens* numerous, on a disk adnate to the perianth-tube. *Carpels* usually several, in the perianth-cup, or imbedded in a fleshy receptacle, each 1-celled, 1-ovuled. *Fruiting* carpels generally drupaceous. *Embryo* small, in the axis of endosperm.

Species 150, chiefly of the southern tropical and temperate lands; most of the genera in the Orient and Australia; some in Africa, some in Brazil.

LAURELIA Juss.

Trees or shrubs with diœcious or monœcious *flowers*. *Stamens* 6–12, filaments short with an oblong gland on each side, *anther-cells* distinct, opening by uplifted valves. *Female flowers* with staminodes; carpels long-pilose, ending in plumose *styles*. *Ovule* erect.

Species 2, one in New Zealand and the following:

L. SEMPERVIRENS (Ruiz & Pav.) Tul. (*L. aromatica* Poir.)

Scented tree. *Leaves* obovate- to ovate-lanceolate, serrate, petiolate, 5–9 cm. long. *Raceme* silky-pubescent. *Tepals* of female flower distinct, remote, the outer shorter.

(Chili; also cultivated and its leaves used for infusing and as a potherb, and nuts edible); W. Patagon., by Lago Nahuel-haupi. Fig. in Eng. & Prantl, iii, 2, p. 102, A–D.

Family 43. PAPAVERACEÆ. Subfamily *Fumarioideæ*. Fumitory.

Delicate, smooth herbs, with finely dissected *leaves*, and zygomorphous *flowers* in racemes or spikes, or rarely solitary. *Sepals* 2, minute. *Petals* 4, outer pair larger. *Stamens* 6, diadelphous, opposite the outer petals. *Embryo* minute.

FUMARIA Linn.

Fruit rounded, indehiscent, 1-seeded.

Species 15, Old World.

1. F. CAPREOLATA Linn.

Sepals scarcely one fifth as long as the corolla. The globose *fruit* is constricted at the base into a neck. Fruiting *pedicels* recurved, longer than the bract.

Partially climbing, by means of its long twining petioles.

(Eur., W. Asia, and N. Afr.); common about Buenos Aires and southward; in N. Patagon.; "doubtless introduced." (J. Ball.)

2. F. MEDIA Lois.

Sepals one third as long as the corolla. *Fruit* globose, depressed; fruiting *pedicels* erect, twice as long as the bract. *Racemes* rather lax. *Stems* erect. *Leaves* compound above, their petioles subcirrhose. Annual.

(Europe); N. Patagon., in fields near Carmen.

Family 44. CRUCIFERÆ. Mustard Family.

Herbs, with watery pungent sap, alternate leaves, and racemose to corymbose, hypogynous, cruciate flowers, sometimes apetalous. Stamens 6, tetradynamous, or fewer by abortion. Ovary 2-celled, with a thin septum and parietal placentæ. Fruit a silique, or a silicle. Seeds with folded embryo, and no endosperm.

Species 1,500, widely distributed, especially extratropical; non-poisonous. (In collecting secure the ripe fruit.)

KEY TO THE GENERA.

A. Hairs simple or none. No glandular hairs nor glandular tubercles.

*b*1. Style long. Silicle winged, its cells 1-seeded. Leaves pinnatifid. Flowers white. 1. *Menonvillea*, p. 424.

*b*2. Stigma equally developed on the style, capitate. Silicle on a gynophore; its mericarps winged on the margins and mid-nerve, 1-seeded. Septum narrow; radicle lateral on cotyledons. Flowers white. 2. *Hexaptera*, p. 424.

*b*3. Stigma strongly developed above the placentæ; more or less 2-lobed, or depressed in the notched pod.

*c*1. Cotyledons starting below the bend of the embryo. Silicles basally rounded to cordate, its cells 1-seeded, seed pendulous. Lateral and median honey-glands. Stamens sometimes 4 or 2, or more than 6. Radicle usually dorsal.

*d*1. Silicle 2-valved, with lanceolate or elliptic septum. Petals white, rarely yellowish or none. 3. *Lepidium*, p. 425.

*d*2. As *Lepidium*, but stamens 6; cells of silicle communicating by chinks, and leaves minute, imbricating. 4. *Delpinoëlla*, p. 427.

*d*2. Silicle indehiscent, broader than long, didymous, its septum linear. Petals white, rarely purple or none. 5. *Coronopus* (*Senebiera*), p. 427.

*c*2. Cotyledons starting at the bend of the embryo.

*d*1. Silicle winged all round, septum narrow; or a 1–2-seeded schizocarp. Cotyledons not folded; radicle lateral. Only lateral honey-glands. Calyx not gibbous. Petals white, rarely pink. 6. *Thlaspi*, p. 428.

*d*2. Fruit a silique, rarely a silicle; sometimes transversely segmented, or a 1–2-seeded schizocarp. Usually both lateral and median honey-glands.

*e*1. Style more or less lobed, or depressed.

*f*1. Embryo with dorsal radicle and flat or arched or longitudinally folded cotyledons. Silique long, 2-valved, with numerous, 1-(rarely 2-) seriate globose, wingless seeds. Style short, 2-lobed. Median honey-glands. Flowers yellow, rarely white or pink. Leaves entire, or toothed, or pinnately lobed. 7. *Sisymbrium*, p. 429.

*f*2. Embryo with the cotyledons longitudinally folded. Siliques, sometimes transversely segmented, with erect seeds, and mostly a soft septum in the distal segment. Flowers racemose. Median honey-glands.

*g*1. Seeds all pendulous; or distal seeds erect, but not in a specially enlarged segment. Silique with an apical, not flattened, rostrum. Cotyledons conduplicate.

*h*1. Silique dehiscent; its seeds 1-seriate, globular or slightly compressed. Cotyledons 2-lobed. Flowers yellow or white to violet. 8. *Brassica*, p. 432.

*h*2. Silique dehiscent, constricted between the seeds, but not jointed. Petals white or yellow. 9. *Raphanus*, p. 433.

*g*2. Seed solitary in a special apical segment, enlarged before anthesis; the normally barren proximal part of the silique resembling a gynophore. Cotyledons 2-lobed; radicle dorsal. Petals white.
10. *Crambe*, p. 433.

*f*3. Embryo with lateral radicle. Fruit dehiscent, its valves with the mid-vein obsolete. Median honey-glands present or not.

*g*1. Valves convex. Fruit globular to linear. Seeds minute, round, 2-seriate. Petals white or yellow, not cleft.

11. *Roripa* (*Nasturtium*), p. 433.

*g*2. Valves flat (save impressions by seeds); finely reticulate; elastically dehiscing. Seeds 1-seriate, pendulous, mostly wingless. Stem leafy, at least below. Petals white or pink (rarely none).

12. *Cardamine*, p. 435.

AA. Hairs all or some branched; rarely unbranched or none. Sometimes also glandular hairs or gland-tubercles.

*b*1. Stigma equal all round, on the simple or prolonged or lobed style.

*c*1. Silique linear, its values flat. Radicle dorsal. Petals pinnatifid, white or purple.

13. *Schizopetalum*, p. 439.

*c*2. *Silicle* globular, septum as broad as the fruit. Radicle lateral. Petals entire, yellow.

14. *Lesquerella* (*Vesicaria*), p. 439.

*b*2. Stigmas stronger above the placentæ; style simple or more or less 2-lobed above the placentæ.

*c*1. Surface-cells of the septum not transversely divided.

*d*1. Surface-cells of septum without parallel partitions.

*e*1. Fruit mostly short, a silicle; seeds several in its cells. Only lateral honey-glands. Flowers small, white.

*f*1. Valves carinate, with a strong mid-vein. Septum narrow.

*g*1. Silicle apically rounded or pointed. Radicle varying.

15. *Hutchinsia*, p. 440.

*g*2. Silicle distally broadened or indented and obcordate. Radicle lateral.

16. *Bursa* (*Capsella*), p. 440.

*f*2. Fruit oblong to linear, a rather flat silicle. Seeds 2-seriate, wingless. Filaments winged or toothed. Petals white, sometimes yellow, entire or cleft. 17. *Draba*, p. 441.

*e*2. Fruit mostly a long silicle or a silique; style short, rarely depressed. Lateral honey-glands uniting with a median into a ring (or no mid-gland).

*f*1. Fruit linear or lanceolate, with fibers in the septum. Seeds oblong, wingless; radicle dorsal. Leaves dissected. Petals yellow.

18. *Sophia* (*Descurainea*), p. 447.

*f*2. Fruit linear, no fibers in the septum. Valves flat, with weak mid-vein, not elastically dehiscing. No gynophore. Seeds flat, winged or marginless. Radicle lateral. Petals white or yellow, entire.

19. *Arabis*, p. 451.

*d*2. Surface-cells of the septum with many parallel parti-walls, polygonally arranged in special cells. Silicle pyriform to elliptic, or a 1-seeded achene. Radicle lateral. Honey glands lateral, or also with 2 mid-glands. Flowers racemose. Petals yellow, entire.

*e*1. Calyx open or erect, not saccate. Silicle more or less flat; its cells 1-several seeded. seeds wingless. 20. *Alyssum*, p. 451.

*e*2. Calyx closed, saccate or not. Silicle inflated, its valves cartilaginous; basi-attenuate. Seeds flat. 14. *Lesquerella* (*Vesicaria*), p. 439.

*c*2. Surface cells of the septum transversely parted. Flowers white to purple.

*d*1. No glandular hairs or tubercles. No fibrous layer on the septum. Fruit ovate to linear, with convex valves and capitate stigma. Seeds 2-ranked. Radicle dorsal (?). 21. *Braya*, p. 451.

*d*2. Glandular hairs or tubercles usual. Hairs usually branched. Radicle dorsal. Stigma with 2 erect lobes. Siliques subcylindric; valves 1-nerved. Seeds 1-ranked. 22. *Hesperis*, p. 453.

1. MENONVILLEA DC.

Perennial to suffruticose, smooth plants, with linear or pinnatifid *leaves*, rather fleshy, and racemose *flowers*. *Sepals* long, erect, saccate. *Petals* linear, white or dull red. *Honey-glands* upright, scale-like. *Silicle* on a gynophore, dorsally compressed, with broad lateral *wings*, and long *style*. *Mericarps* 1-seeded. *Embryo* incumbent.

Species 4 in Chili and Peru. Closely allied to *Decaptera* and *Hexaptera*.

M. PATAGONICA Speg.

Low, hispid, green annual, with simple hairs; branching from the base. *Leaves* pinnatifid. *Racemes* dense-corymbiform, elongating in maturity; rachis straight or subflexuose. *Flowers* small, white. *Silicle* glabrous, its valves suborbicular, subconvex ventrally, concave dorsally, having a mid-nerve, otherwise smooth. *Wing* broad, rigid, repandulous at apex and emarginate at base.

Chubut, in dry hills between Teka-choique and Carren-leofú.

2. HEXAPTERA Hook.

Herbs or undershrubs, with radical and cauline, entire or pinnatifid, subspatulate *leaves*, and short, bractless corymbs of whitish *flowers*. *Sepals* equal at the base. The longer *stamens* sometimes connate in pairs. *Silique* rather large, dorsally compressed, 6-winged; the cells 1-seeded. *Style* short. *Stigma* capitate. *Seeds* not margined. Cotyledons plane.

Species 7, Chili and Patagon.

1. H. CUNEATA Gill. & Hook.

Slightly hairy. *Leaves* with slender petioles, apically 3-toothed, only 1-nerved. *Stems* cespitose, ultimately erect.

Chili; N. W. Patagon., on dry rocks near Lago Nahuel-huapi.

2. HEXAPTERA NORDENSKJÖLDI Dusén. (Plate XVII.)

Root stout, fusiform. *Stems* numerous, simple or nearly so, thickish, with the leaves crowded upwards. *Leaves* woolly, cuneate, 3-nerved and 3-lobed, the lobes narrow, rounded at the apex. *Racemes* dense, hemispherical. *Sepals* oval, 3-nerved, hairy outside. *Petals* spatulate, twice as long as the sepals, pale yellow, reddish upwards.

S. Patagon., O. Nordensk. at Cerro Contreros, 900 meters altitude; near source of Rio Coy, by Hatcher; "abundant in Cordilleras above the timber-line." Hatcher's specimens have the petals and the lobes of the leaves broader than in Dusén's description.

3. H. TRIDENS Phil.

Hoary pilose. Leaves obscurely and long triangular, apically truncate and 3-toothed. *Petals* white.

Mountains at Cuestada Maracoyo, S. Amer., at 4,000 meters elevation. (Not in Patagonia?)

3. LEPIDIUM Linn. Pepper-grass.

White *flowers*, often with fewer than 6 *stamens*. *Petals* short or none. *Silicles* oblong or obovate, flat with narrow septum, its valves keeled, dehiscent. *Seeds* 1 in each cell, flat. Cotyledons incumbent (or falsely accumbent through torsion). (Figs. in Eng. & Prantl, iii, 2, p. 160.)

Species 160, most in temperate zones; some in Chili, Argentina, Australia and New Zealand.

KEY TO THE SPECIES.

A. Leaves entire, or the lower pinnatifid, linear. Silicles orbicular, longer than the pedicel. Flowers small.	*spicatum.*
*A*2. Leaves bipinnatifid, and further cleft.	*bipinnatifidum.*
*A*3. Leaves once-pinnatifid. Silicles wingless.	*bonariense.*
*A*4. Lower leaves pinnatifid, others entire.	
b. Silicles suborbicular, wingless. Petals none. Flowers small.	*ruderale.*
*b*2. Silicles oval-orbicular. Petals none in upper flowers. Pedicels inclined.	*racemosum.*
*b*3. Silicles oval, winged all round.	*sativum.*

1. L. BIPINNATIFIDUM Desv.

5–30 cm. high, branches pubescent. *Leaves* 2-pinnatipartite, their lobes multifid; rachis winged. *Silicles* oval, emarginate, half as long as the pedicels.

(Widely distributed, about habitations.) Magellan, N. and E. Fuegia. (Dusén.)

2. LEPIDIUM BONARIENSE Linn. 1753. (*L. pubescens* Desv., 1814.)

Stem and pedicels villous. Upper branches surpassing the stem. *Leaves* glabrous, pinnatifid; the lobes linear, few-toothed. *Flowers* minute. *Silicle* subelliptical, retuse-emarginate, its valves carinate, wingless. *Style* very short.

Of wide range through Brazil and N. Patagon.; S. Patagon., by Rio Sta. Cruz; Magellan. Varying much: form *typica* is tall, with spicate flowers; form *salinicola*, dwarf, with lax racemes.

3. L. RACEMOSUM Gris.

Diffuse annual, stem puberulous. *Leaves* glabrous, pinnatisect, with few pairs of segments, these oblong-linear, acutish; in the lower leaves with a short anterior tooth. *Racemes* dense, the *pedicels* equalling the silicle. Upper *flowers* apetalous, with 2 *stamens*. *Silicle* oval-orbicular, emarginate. *Stigma* sessile. *Valves* at length reticulate.

Magellan, at Oazy Harbor, and at Punta Arenas. Brunswick Penins., about the bays and capes. (Lechler).

4. L. RUDERALE Linn.

Radical leaves pinnatifid. *Cauline* linear, entire, or nearly so; all glabrous. *Flowers* minute, usually apetalous, 2-staminate, with minute style on the small, roundish, emarginate *silicle*. (Fig. in Brit. & Br. ii. 111.)

(Eur. & N. Amer.), Patagon., by R. Sta. Cruz, not common, a low and weak form; and near Rio Negro.

5. L. SATIVUM Linn. Garden-cress.

Leaves variously divided and incised, the upper being smaller and often entire, all bright green. *Silicles* orbiculate, 4 by 2 mm., emarginate, the valves navicular, winged. *Styles* very short.

(Eur. and N. Am. in waste places and cultivated); S. Patagon., in fields near R. Sta. Cruz.

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6. LEPIDIUM SPICATUM Desv.

Leaves linear, entire, or the lower pinnatifid, glabrous. *Flowers* small. *Silicle* orbiculate, emarginate, rather exceeding the pedicel; its *valves* carinate, wingless. *Style* short.

(Chili; Brazil); Patagon., by R. Sta. Cruz; Magellan; Fuegia, Ushuaia.

4. DELPINOËLLA Speg. (Nova Addenda ad Floram Patagonicam, p. 227.)

(*Cruciferacea lepidinea.*) *Sepals* equal at the base, not saccate. *Petals* linear, entire. *Stamens* 6, free, not toothed. *Silicles* didymous, laterally compressed, slightly retuse at apex, the *valves* turgid, coriaceous, 1-locular, ventrally gaping by a chink, dorsally callus-marginate, externally rugose, 1-*seeded*. *Style* persistent, longish, thickish; *stigma* capitellate subentire. *Seeds* solitary and pendulous in the locules, obovate, rostrate, immarginate (rimless); *testa* membranaceous with a thin muciparous tunic; *endosperm* mucous, sparse; *embryo* largish, green; cotyledons *incumbent; radicle* very long, scarcely curving, superior.

A woody glabrous undershrub, with very short branchlets at the tops of the branches densely botryose-cespitose; *leaves* minute, ovate, densely imbricate; *flowers* small solitary, subsessile on acrogenous branchlets; *fruit* largish, glabrous.

(Allied to *Coronopus* by the structure of the silicle.)

D. PATAGONICA Speg.

Densely cespitose, green; branches subdichotomous. *Leaves* narrow, somewhat acutish, and somewhat subcarinate. *Flowers* white. *Silicles* surrounded by the persistent sepals which are scarcely accrescent.

Patagonia, in the dry, rocky, high plane between San Julian and Rio Deseado. Resembling in habit *Braya pycnophylloides* Speg. and *Benthamiella pycnophylloides* Speg., and having a long vertical root.

5. CORONOPUS Gaertn. (*Senebiera* Poir.)

Leaves mostly pinnatifid. *Flowers* small, whitish. *Stamens* often 2 or 4. Silicle small, didymous, flattened with a narrow septum; its cells 1-seeded, indehiscent, falling away as mericarps. *Cotyledons* incumbent or conduplicate.

Species 12, subtropical in Old World and Austral.; in N. Amer.; and the following:

1. Coronopus australis (Hook. f. sub *Senebiera.*)

With sparse spreading *hairs.* *Stems* diffuse, ascending, branching. *Leaves* subpinnatifid with incised lobes. *Silicles* on long pedicels, rather large, slightly reticulate.

Patagon., by Lago Argentino; Isla Pavon in R. Sta. Cruz.; Chonos Archip.; (also in Jamaica and S. United States.)

Allied to *C. pinnatifidus* of Eur. and of N. and S. Amer.

2. C. coronopus (L.) Karst. *C. coadunatus* Stokes, *C. didymus* L. (non Smith), *Senebiera pinnatifida* (DC.).

Leaves pinnatifid, the lobes entire or toothed or pinnatifid. *Sepals* roundish, their margins whitish, membranaceous. *Pedicels* stout. *Silicles* acutish, their valves crested and wrinkled; 4 mm. broad by 3 mm. high.

(Eur., nat. in N. Amer.) Fuegia, at Ushuaia, rare, in dry meadows. N. Patagon., plains near Carmen.

3. C. didymus Smith.

Silicle-valves not crested, only 2 by 1 mm. *Pedicels* slender. (Fig. in Eng. and Prantl, iii, 2, p. 161.

S. Amer. and northwards in N. Amer., Old World, and N. Austral.

4. C. rhytidocarpus (Hook. sub *Senebiera*).

Slender procumbent, branching. *Leaves* entire or pinnatifid, with few segments, acute. *Corymbs* small, of few minute flowers. *Sepals* concave. *Petals* at least sometimes none. *Stamens* 2? *Silicle* orbicular, rugose.

Patagon.

6. THLASPI Linn.

Erect, glabrous herbs, with basal, rosulate *leaves*, and upper cauline *leaves* auriculate and clasping. *Flowers* white or purplish. *Silicles* mostly emarginate, flat, with narrow septum. *Seeds* 2 or more in each cell. *Cotyledons* accumbent.

Species 60, Eurasian; most in Mediterr. region, with outliers in Austral., N. Amer. and Chili.

1. THLASPI ALPESTRE Linn.

Leaves entire, the radical ovate, petiolate, the cauline oblong, amplexicaul. *Petals* about equal to sepals. *Silicles* obcordate, 8–12-seeded; their valves winged dorsally. *Style* filiform. *Seeds* not striate.

(European Mts.); Cordilleras of S. Patagon.

2. T. GLAUCOPHYLLUM Barn.

Cespitose. *Stems* leafy, glabrous, erect, simple. *Leaves* glaucous, glabrous; the radical oblong, attenuate, petiolate, entire; the cauline sessile, ovate, basi-auriculate. *Flowers* white, corymbed. *Silicle* oblong-obovate, not winged, 10-seeded, submarginate. *Style* nearly half as long as the ovary.

(Chili); S. Patagon., by R. Sta. Cruz.

3. T. MAGELLANICUM Pers.

Perennial, 7 cm. high. Radical *leaves* oval-spatulate, stalked, almost entire; cauline oblong-sessile. *Flowers* small, white. *Petals* about equal to sepals. *Silicle* obovoid, truncately-emarginate. *Style* short. *Seeds* 8, oval-oblong, rufous, flat, not striate.

Magellan, at Sta. Magdalena by Cunningham; Rio Coy (Hatcher); E. and N. and S. Fuegia; "a steppe plant" (Dusén). Over nearly all Patagonia. "Seeming not to differ from *T. andicola* H. & A. The characters by which Reiche differentiates these are all fallacious." (Speg.)

7. SISYMBRIUM Linn.

Silique linear or linear-oblong, sessile, style short. *Sepals* subequal at base. *Seeds* 1-seriate, ovate or oblong, not margined. *Cotyledons* incumbent. *Annual* or *biennial* herbs with toothed or pinnatifid *leaves*, and simple *pubescence*. Species 50, widely distributed.

KEY TO THE SPECIES.

A. Leaves entire, linear. Glabrous, cespitose plants.	*patagonicum.*
A2. Leaves oblong, the cauline sagittate. Flowers white; stigmas 2-lobed.	*andinum.*
A3. Leaves variously pinnatifid. Flowers yellow.	
b. Leaves runcinate-pinnatifid. Siliques linear-acuminate, appressed to stem.	*officinale.*

*b*2. Leaves pinnatifid, their lobes repand. Petals white, twice as long as sepals. Stigma hemispherical. *maclovianum*
*b*3. Leaves 1–2-pinnatifid. Siliques subclaviform, on oblique pedicels. *antarcticum.*
*b*4. Leaves 2–3-pinnatifid. Pedicels spreading. *sophia.*
*b*5. Leaves all basal, remotely pinnatifid, long-petioled. Racemes long. *ameghinoi.*
*b*6. Leaves pinnatifid with linear lobes. Racemes terminal on branches. *tehuelches.*

1. SISYMBRIUM AMEGHINOI Speg.

Fleshy, glabrous perennial, with numerous, simple or subsimple stems arising from the root-crown, bearing flowers and fruit almost from their base. *Leaves* subfascicled, all radical or basal; oblanceolate in outline; remotely pinnatifid, lobes short, broad, obtuse; petiole as long as the limb. *Flowers* small in long racemes; *sepals* ovate, obtuse, glabrous; *petals* white, scarcely longer; *siliques* subtorulose, erect, appressed, largish, on a petiole one third as long; *stigma* thick, 2-lobed, sessile; *seeds* 1-seriate.

Chubut, in dry places along Rio Chico.

2. S. ANDINUM Phil.

Suffruticose, glaucescent, glabrous or hairy, to 60 cm. high, branching, leafy. *Basal leaves* subrosulate, oblong, obtuse, attenuate-petiolate, 5 cm. long, 10 mm. broad; *cauline leaves* sagittate, partly clasping; entire or remotely toothed. *Flowers* white, many in a corymb, at length racemose. *Siliques* surmounted by a thick, 2-lobed, subsessile *stigma*, themselves 3–4 times as long as the pedicel.

(Chili); Patagon., in meadows by Rio Sta. Cruz & Golfo de San Jorge. "Near *S. sagittatum.*" (Phil.)

3. S. ANTARCTICUM Fourn. (*S. canescens* Gris. non Nutt.)

Shortly pilose annual. *Stem* 80 cm. high, rather strong, with long branches. *Leaves* sparse, radical ones crowded, 5 cm. long, with plane rachis, and 5–6 prs. of pinnæ; oval, broad, passing into crenate-lobed, obtuse pinnules. *Pedicels* branching, bractless, spreading, thickish, straight, in fruit 7–8 mm., shorter than the flowers. *Sepals* yellowish, oblong, marginally lucid. *Petals* pale yellow, shorter than the sepals. *Siliques* on an oblique pedicel, subclaviform, subtetragonal, falcate, 16 mm. long. *Seeds* 2-ranked.

Magellan.

4. SISYMBRIUM MACLOVIANUM Gaud. (*S. fuegianum* Speg.)

Leaves radical, pinnati-partite, the lobes obtuse, repand-toothed, glabrous or with forked hairs. *Flowers* racemose-corymbose, *pedicels* long or short, 7–8 mm. long and broad. *Sepals* entire, ovate-elliptical, 4 mm. long, white to pale green, glabrous, uniting, the outer slightly larger. *Petals* twice as long, white, spatulate, unguiculate, 3-nerved. *Ovary* elliptical-terete, rounded on both sides, with forked hairs at base. *Style* short. *Stigma* hemispherical. *Silique* white to purplish; the valves slightly costulate. *Seeds* 2-seriate.

S. Patagon., near Lago Argentino. With glabrous and hispid varieties. ("Badly described in the books; its incumbent cotyledons seem to show that it is *Sisymbrium*.") (Speg.)

5. S. OFFICINALE (Linn.) Scop.

Erect, 30–90 cm. tall, with rigid, spreading, branches. *Leaves* runcinate, pinnatifid, the upper nearly sessile, the terminal lobe oblong, toothed. *Pedicels* 2 mm. long, erect in fruit; *flowers* yelolw. *Siliques* 12 mm. long, linear-acuminate, appressed to the stem. *Valves* with a strong rib.

(Eur., nat. in N. Amer.); Magellan; Elizabeth I.

6. S. PATAGONICUM (Speg.)

Cespitose, glabrous perennial. *Stems* sigmoid-flexuose when erect. *Leaves* all entire, linear. *Flowers* small, racemose, long-peduncled. *Siliques* slender, very long, on long pedicels.

S. Patagon., by streams near Lago Argentino, abundant.

(*S. pinnatum* and *S. sagittatum* sub *Sophia*.)

7. S. SOPHIA Linn.

Hoary, with 2–3-pinnatifid leaves, their lobes linear to linear-oblong. Peduncles slender, ascending, thrice as long as the spreading pedicels. Petals yellow, shorter than the calyx. Seeds in 1 row.

(Eur., N. Amer.); Patagon., by Rio Chubut and Rio Chico.

8. S. TEHUELCHES Speg.

Glabrous, fastigiately branching perennial, the old branches woody cinereous, the innovations subherbaceous, greenish-white, terete. Cauline *leaves* pinnatifid with rachis and 1–5 pairs of often alternate lobes, remote, entire, acute, narrow-linear. *Flowers* in terminal *racemes* on the branches, largish, with pedicels of their own length; *petals* white, spatulate, twice as long as the yellowish-green, glabrous obtuse *sepals.* *Siliques* thickish, erect.

Patagon., near Golfo de San Jorge, between San Julian and Rio Deseado, and along Rio Chubut. ("Formerly confounded by me with *S. pinnatum.*" Speg.)

8. BRASSICA Linn. Cabbage, Turnip.

Erect, branching herbs with pinnatifid basal, and toothed or entire cauline *leaves;* and yellow, racemose flowers. *Siliques* elongated, terete or 4-sided, usually tipped by an indehiscent, 1-seeded beak; the valves convex, 1–3-nerved. *Seeds* 1-seriate in the cells, marginless. *Cotyledons* conduplicate.

Species 50, Mediterr. Region, and Asia; cultivated and run wild in extratropical climates.

1. B. CAMPESTRIS Linn.

30–60 cm. tall, glabrous or nearly so. Lower *leaves* petioled, pinnatifid; upper lanceolate to oblong, clasping by rounded auricles. *Flowers* bright yellow, 9 mm. broad. *Pedicels* rather spreading. *Silique* 4 cm. long, its beak 9 mm. long. *Seeds* subspherical.

N. Patagon., as far S. as Rio Chubut. Produces tough and stringy turnips, which trouble farmers; called "Napur." (J. Ball.) Doubtless introduced.

2. B. MAGELLANICA Pers.

Leaves pinnatipartite, glabrous. *Flowers* corymbose. *Petals* white, their limb obovate. *Silique* sessile, not beaked.

Magellan, Navarino I., Falklands.

3. B. NAPUS L. Rape.

Leaves glabrous, subglaucous; the lower lyrate, toothed, cuneate; the upper cordate-lanceolate, entire, amplexicaul. *Siliques* spreading torulose. *Petals* yellow, rather small.

E. Fuegia (Dusén; "doubtless introduced").

4. B. NIGRA (L.) Koch. *Sinapis n.* (Linn.) Black Mustard.

Erect; 1 m. tall. *Lower leaves* slender-petioled, deeply pinnatifid, with large, terminal lobe, toothed all round. *Upper leaves* more sessile, not clasping; *uppermost* are entire lanceolate blades. *Flowers* yellow, 8 mm. broad, the pedicels slender, appressed. *Silique* 4-sided, narrow-linear, 12 by 1 mm. *Raceme* narrow. *Seeds* dark.

(Eurasia, nat. in N. and S. Amer.) N. Patagon.

9. RAPHANUS Linn.

Erect, branching herbs with lyrate *leaves* and showy *flowers*. *Style* slender. *Silique* linear or oblong, tapering apically, indehiscent, constricted or continuous, spongy between the seeds. *Seed* subglobular.

Species 6, natives of Eurasia.

1. R. RAPHANISTRUM Linn. Wild Radish.

Stem 30–45 cm. high. *Leaves* petiolate, rough. *Flowers* pale yellow to white or lilac. *Silique* long-pointed and longitudinally grooved, 4–10-seeded.

(Eur.); N. Patagon., by Rio Negro.

2. R. SATIVUS Linn.

Achenes fleshy, not longitudinally grooved, 2–3-*seeded*. *Flowers* pink or white. *Root* deep, fleshy.

(Asia); Magellan.

10. CRAMBE Linn.

Branching herbs or shrubs from thick caudex, usually with large pinnatisect *leaves*, and long or compound *racemes* of white *flowers*. *Sepals* subequal. The longer *stamens* often toothed outside. *Silique* erect-patent, 2-jointed, indehiscent, the lower joint like a pedicel. *Seeds* globose. *Cotyledons* conduplicate.

Species 16, Eurasia and Atlantic Is.

C. FILIFORMIS Jacq.

Stem solitary, slender, rather hispid below. *Leaves* pinnate-lyrate, pilose, the terminal lobe ovate. *Filaments* long, scarcely toothed. *Silicles* blunt, slender, 2-jointed, terete, the lower joint the longer.

(Chili); Magellan.

11. RORIPA Scop. 1760. (*Nasturtium* R. Br. 1812.)

Branching herbs, with simple or pinnate *leaves*, and yellow or white *flowers*. *Sepals* spreading. Stamens 1–6. *Siliques* short or long, their valves usually 1-nerved. *Seeds* mostly 2-seriate in each cell. *Cotyledons* accumbent. *Pubescence*, if any, simple.

Species 25, chiefly N. Temperate.

1. RORIPA BONARIENSIS (DC. sub *Nasturtium*).

Annual, with pinnatipartite *leaves;* the lobes distant, linear, subdentate, glabrous. *Silique* suberect, terete-compressed, 2–3-times as long as the *pedicel.*

(Argentina); Patagon., near Rawson (Dusén).

"The Patagonian specimens always have *white petals*, often with a rose tinge on the outside." (Speg.)

2. R. PALUSTRIS (L.) Bess. Yellow Water-cress.

Erect, annual or biennial, nearly glabrous. *Lower leaves* petioled, oblong or oblanceolate, pinnatifid, the lobes repand or toothed; *upper leaves* subsessile, dentate. *Pedicels* slender, 6 mm. long in fruit. *Flowers* yellow, 5 mm. broad. *Siliques* linear or linear-oblong, as long as the pedicels. *Style* 1 mm.

(Eur., N. Amer.); Chubut, in marshes by Cabo Raso; by Carrenleofú, etc.

3. R. PATENS Phil.

Tall, branching, perennial (?). Lower leaves (?). Upper *leaves* distant, pinnate-lyrate; pinnules 3 pairs, linear, entire or toothed, terminal lobule oblong; uppermost leaves simple. Racemes large; peduncles longer than the calyx, which is shorter than the white petals. Stigma sessile. Siliques 2–5 cm. long, with horizontal pedicels, 4 mm. Valves nerveless (not as in the other species).

Patagon., in wet places by Rio Sta. Cruz and Lago Colu-huapi. Here the color is slightly glaucescent; lobes of leaves coarsely 3–5-dentate.

4. R. PHILIPPIANA (Speg. sub *Nasturtium; N. micranthum* Ph. non DC.).

Branching annual, 20 cm. high. *Leaves* various, pinnatipartite with broad segments to lyrate; *pinnæ* 2–4 pairs, dentate in the lower, entire in the upper leaves; the terminal lobe ovate, dentate. *Silicles* almost erect, 12 mm. long by 1.5 mm. or thicker, on oblique pedicels 2–3 mm.

Patagon., by Rio. Sta. Cruz; Golfo de S. Jorge: by Rio Negro, near Carmen.

RORIPA PUBESCENS PINNATISECTA (O. Ktze. sub *Nasturtium*).

Leaves pinnatisect.

(Chili; Argentina); Patagon.

12. CARDAMINE Linn. Bitter-cress.

Erect or ascending herbs, with entire or lobed or pinnate leaves, and white or purple racemes. Siliques long, flat, usually erect; their valves nearly nerveless, elastically dehiscing. Stipe none. Seeds 1-seriate in each cell, marginless. Cotyledons accumbent.

Species 75, in temperate regions.

KEY TO THE SPECIES.

A. Leaves pinnate.	
b. Leaflets orbicular, abruptly attenuate basally.	*hirsuta.*
*b*2. Leaflets not basi-attenuate.	
c. Terminal leaflet reniform.	*glacialis.*
*c*2. Terminal leaflet obovate.	*strictula.*
*c*3. Pinnæ 5, rounded. Sepals ribbed.	*corymbosa.*
*c*4. Leaflets all basal, ciliated; terminal pinnæ large.	*ciliata.*
*c*5. Lower leaves lyrate, segments reniform. Stigma capitate.	*tuberosa.*
*c*6. Terminal leaflet cuneate-oblong, 3-toothed; upper leaves ternate.	*ramosissima.*
*c*7. Lower leaves entire, small, with a pinnate pair below; cauline leaves simple.	*nana.*
*A*2. Leaves pinnatisect.	
b. Segments of radical leaves rounded, of cauline angulate. Style filiform.	*amara.*
*b*2. Segments of radical leaves rounded, of upper oblong-sessile. Style thick. Stout herb.	*antiscorbutica.*
*b*3. Bipinnatisect; cauline leaves similar, but smaller.	*geraniifolia.*
*A*3. Leaves pinnatifid.	
b. Segments of radical leaves 2–3 pairs. Petals 2–3 times as long as sepals.	*magellanica.*
*b*2. Segments linear-lanceolate. Siliques divaricately erect. Styles long.	*patagonica.*
*b*3. Segments 3 pairs, fleshy. Style none. Stem none.	*pygmæa.*
*A*4. Leaves cordate-rounded, entire toothed.	*rostrata.*
*A*5. Leaves all entire, oblanceolate. Floating plant, long stem rooting.	*callitrichoides.*

1. C. AMARA Linn.

Leaves pinnatisect; segments of radical leaves subrotund, of cauline dentate-angulate. *Style* filiform, acutish. *Stem* rooting at the base.

(Eurasia.) Patagon., Punta Arenas. (J. B. Hatcher.)

2. C. ANTISCORBUTICA Banks & Sol.

Robust, sometimes villous, from a branching rhizome. *Leaves* rosulate, pinnatisect, varying; radical leaflets 3–4 pairs, rounded, stalked;

toothed; upper leaflets oblong, subsessile. *Racemes* contracted at anthesis; in fruit with erect, large peduncles. *Petals* twice as long as sepals. *Style* thick.

Magellan, Beagle Channel to Cape Horn; Chubut, by streams in subandine woods.

CARDAMINE ANTISCORBUTICA ANDICOLA Alboff.

Low, glabrous, many-stemmed. *Leaves* chiefly radical, the lateral lobes small. Few-flowered *corymb*.

Fuegia Mts., near Ushuaia.

C. ANTISCORBUTICA UMBROSA Alboff.

Pubescent. *Leaf-lobes* all similar, except size. *Raceme* lax. *Fruit-style* long.

Fuegia, near Olivaia.

3. C. CALLITRICHOIDES Speg.

Stems slender, long, repent below and rooting; above flagellar, floating. *Leaves* all entire, alternate, small, oblanceolate, obtuse, basi-cuneate, subsessile. *Flowers* minute, axillary and solitary in the uppermost part of the branches, shortly pediceled. *Siliques* narrow-linear, acutish.

Chubut, in slow waters by Rio Carren-leofú.

4. C. CILIATA Phil.

Erect, leafless above, glabrous. *Leaves* crowded at base, all pinnate, ciliate. *Pinnæ* stalked, the terminal largest and lobed. *Racemes* with few, short-pediceled flowers, having ciliate *bracts*.

Falklands.

5. C. CORYMBOSA Hook. f.

Branching near the base, the branches slender, flexuose, few-leaved. *Leaves* long-petioled, pinnate; *leaflets* about 5, rounded, subsessile, the lateral ones distant. *Flowers* white, mostly corymbed. *Sepals* ovate, ribbed. *Petals* spatulate.

Fuegia, Orange Harbour. (Also common in Campbell's I., S. of N. Zeal.)

6. C. GERANIIFOLIA DC.

Woody at base. *Radical leaves* long-petiolate, bipinnatisect, pinnules petiolulate, broad ovate, trilobed, and their lobes toothed; *cauline leaves* similar, but smaller. *Corymb* with few, large flowers, white to pinkish. *Silique* linear, obtuse.

Magellan, Fuegia to Cape Horn.

7. CARDAMINE GLACIALIS DC.

Stems much branching, leafy. *Leaves* pinnatisect, subciliate, the lower segments sessile, 2 pairs, very small; the terminal very large, reniform, stalked. *Siliques* subfiliform, erect. *Flowers* white.

N. Patagon., Rio Negro; Magellan, Fuegia, Orange Bay. Falklands. "Nearly under the snow in Fuegia."

8. C. HIRSUTA Linn.

Radical leaves rosulate, pinnate, pubescent, the pinnæ 2–5 pairs, entire, the terminal larger; *cauline leaves* few, with narrow pinnæ. *Flowers* small, white. (Fig. in Brit. & Br. ii. 128.)

Widespread in Old World and U. S.; also in Fuegia, Falklands, and Tristan.

C. HIRSUTA NIVALIS. With larger leaves.

C. HIRSUTA MAGELLANICA (Ph.).

Leaflets or segments of the radical leaves sessile, 2–3 pairs. *Petals* two and a half times as large as the sepals. *Peduncles* 3 mm., and thickish.

Magellan; W. Patagon., in wet shrubberies by Rio Aysen.

9. C. NANA Barn.

Annual, hairy plant (glabrous in Argentina), cespitose. *Leaves* long-petiolate, ovate, small, entire, or with 2 pinnæ below on the petiole; cauline leaves linear-spatulate. *Flowers* small, solitary in the axils. *Petals* white, twice as long as the green *sepals*. *Siliques* erect, narrow, acutish both ways; *stigma* minute, sessile. *Pedicel* subdivaricate, shorter than the subtending leaf. *Seeds* 7–9, 1-seriate.

N. Patagon. in wet places near Carmen.

10. C. PATAGONICA Speg.

Glabrous, perennial herb. *Stem* branching, decumbent below, angular, striate. *Leaves* broad-ovate, the lower with long, the upper with short petioles; deeply pinnatifid, their lobes linear-lanceolate, acute, sparingly and coarsely toothed, and repand-toothed. *Flowers* racemosely spicate, mediocre, white. *Siliques* divaricately erect, glabrous, as long as their pedicel. *Style* rather long.

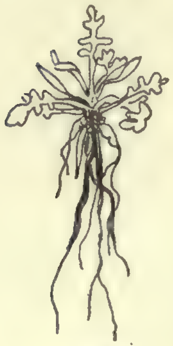
S. Patagon., by Rio Sta. Cruz.

11. CARDAMINE PYGMÆA Dusén.

Very low, stemless, glabrous. *Leaves* subrosulate, about 8, long-petiolate, mostly pinnatifid, segments 3 pairs, fleshy, thick-margined. *Racemes* few-(4–7-) flowered, white; rather large flowers. *Sepals* oval, scarious-margined. *Petals* twice as long, spatulate. *Siliques* patent, as long as the pedicel; stigma sessile.

E. Fuegia. (Dusén.) (Fig. 72.)

Fig. 72.



Cardamine pygmæa (after Dusén).

12. C. RAMOSISSIMA Steud.

Plant hairy rooting from the base of the stem. Radical and lower *leaves* pinnate, 3 pairs, and a larger terminal leaflet, cuneate-oblong, tridentate; *upper leaves* ternate, with linear leaflets. *Raceme* long. *Petals* 6 mm. long, white with a violet center. *Sepals* half as long. *Siliques* erect, 25 by 2 mm., twice as long as the pedicels, attenuate to the style and minute *stigma*.

(Araucania); Patagon., by Carren-leofú, and Rio Sta. Cruz.

13. C. ROSTRATA Griseb.

Smooth, branching perennial, with long-petioled *leaves*, entire or cordate-orbicular, toothed. *Racemes* lax. *Siliques* erect, spreading, compressed, 4 times as long as the pedicels, attenuate to a filiform *style*, subobtuse, 6 mm. long.

Chubut, by Carren-leofú; W. Patagon., by Rio Aysen.

C. ROSTRATA DICHONDROIDES Speg.

Leaves firm, glaucous, not pellucid, entire, often minutely ciliolate. (Sterile peat as of *Dichondra repens* Forst.)

14. C. STRICTULA Steud.

Rhizome sublignescent, fibrilliferous. *Stems* cespitose, or solitary, strict, to 30 cm. pubescent. *Leaves* pinnate, 6–8, pinnæ various, the uppermost usually the largest; the others narrow to oblong, or rounded, toothed or incised. *Flowers* white; *petals* twice as long as the sepals. *Siliques* strict, tetragonal, glabrous, twice as long as the pedicels (34–50 mm.)

Patagon., at Punta Arenas.

15. CARDAMINE TUBEROSA Dmb.

Perennial, hairy or villous. Lower *leaves* lyrate, 1–2(3) pairs of leaflets, the terminal or all reniform; cauline leaves with the terminal part smaller. *Corolla* 8–10 mm. 2–3 times as large as the calyx. *Siliques* 3–4 cm.; pedicels 1.5–2 cm. *Style* short, stigma capitate. Height 25 cm.

(Chili.)

C. TUBEROSA VELUTINA Speg.

Smaller than the species; *stems* and *leaves* very velvety-hispidulous; *Style* of fruit longer.

Patagon., on dripping hills near Putra-choique.

13. SCHIZOPETALUM Sims. (non Boiss.).

Erect annuals, hoary, with branching hairs. *Leaves* sinuate-toothed to pinnatifid. *Raceme* bracted. *Petals* white, pinnately lobed. Silique linear, its valves 1-nerved, reticulate. *Seeds* 1-seriate, globose to oblong. *Cotyledons* incumbent, twisted, bifid.

Species 5, Chili, etc.

S.(?) FUEGIANUM Speg.

Farinose. Stem thick, woody. *Lower leaves* rosulate, ovate-elliptical, long-petiolate, pinnatifid; the lobes broad, obtuse. *Upper leaves* shorter, uppermost sessile. Floriferous branches few-leaved, long-spiked.

Patagon., maritime rocks; Fuegia, on rocks by Elizabeth I., etc.

("Ob petala integra a *Schizopetalo* removenda," v. sub *Sisymbrio*. C. Speg.)

14. LESQUERELLA S. Wats. (*Vesicaria* Lam., p.p.)

Low herbs, with stellate *hairs*, simple leaves, and usually yellow *racemes*. *Petals* entire. *Anthers* sagittate. *Silicle* usually inflated, globose or oblong; the *valves* nerveless; the septum nerved in the upper half. *Seeds* several, flat. *Cotyledons* accumbent.

Species 32, Greenland to Pacific Amer. and middle United States.

1. Lesquerella mendocina (Phil.) Small. (*Vesicaria andicola* Gill., nomen.; *V. arctica* Barneoud.)

Tufted, erect, to 2–4 cm., from woody rhizome. *Leaves* spatulate or oblanceolate, subentire, the upper sessile. *Corymbs* many-flowered. *Petals* 4 mm. long. *Silicle* short-oval, few-seeded, the septum perforated. *Style* slender, 2 mm. Varying as to broadness and margin of the leaves.

(Arctic and N. Amer., Brazil); N. Patagon., along Rio Negro, near Carmen de Patagones.

2. L. montevidensis (Eichl.) Wats. (= "*L. mendocina* Phil." in Index Kewensis, sub *Vesicaria*).

Compactly lepidote. *Leaves* narrow to linear-oblanceolate, entire or repand-dentate. *Flowers* large. *Style* 2 mm. long. *Silicle* 6 mm. *Cells* 4-ovuled.

(Brazil; Chili); N. Patagon.

15. HUTCHINSIA R. Br.

Low herbs with forked *pubescence*, and *racemes* of small, white flowers, the *peduncle* elongating in fruit. *Style* none or short. *Silicle* oval, compressed, with narrow septum; its valves with midrib. *Seeds* numerous.

Species 8, N. Hemisph., 1 in Asia and Austral.; 2 in Bolivia. and 1 in Patagon.

H. reticulata Griseb.

Dwarf, diffuse, glabrous annual. Lowest leaves pinnatisect, long-stalked; segments mostly only 1 pair, short, obtuse. Cauline leaves oblong, auricled or entire. Flowers few. Silicles oblong, obtuse. Valves reticulate. Cotyledons accumbent.

Patagon., by Golfo de San Jorge, and Lago Argentino; Magellan, Brunswick Penins.

16. BURSA Weber. (*Capsella* DC.) Shepherd's-purse.

Erect annuals, with forked *hairs*, and basal rosettes of pinnatifid *leaves*. *Silicles* cuneate-obcordate, compressed, with narrow septum; the *valves* keeled. *Style* short. *Seeds* numerous. *Cotyledons* accumbent.

Species 2, Eur., widely distributed as weeds and polymorphous. Some Australian forms are also closely allied to this genus.

1. BURSA BURSA-PASTORIS (L.) Brit.

Flowers white. *Stem-leaves* few, auricled-dentate to entire.

Patagon., near Rawson (Dusén); Magellan; Fuegia, Ushuaia.

2. B. PROCUMBENS (Linn.) O. Ktze. (*Hutchinsia* Hook. f.)

Dwarf, 3–8 cm. high. *Leaves* entire or deeply toothed, not pinnatifid. *Racemes* elongated and open in fruit. *Petals* as long as the calyx. *Capsule* narrowed at both ends.

(New Zealand); Patagon., near Lago Argentino, by Golfo de San Jorge, and Rio Chubut.

15. DRABA Linn. Whitlow-grass.

Low, mostly *stellate-hairy*, with simple, often rosulate *leaves* and mostly bractless *racemes*. *Silicles* elliptic or oblong, or long, like siliques, flat. *Stigma* subentire. *Seeds* 2-seriate, wingless. *Cotyledons* accumbent.

Species 150, N. Temperate and Arctic; few in Southern S. Amer.

KEY TO THE SPECIES.

A. Small, hirsute below with stellate hairs; scape naked above.	
b. Flowers green, apetalous. Silique with simple hairs.	*ameghinoi.*
b2. Flowers small, white. Silique glabrous.	*argentina.*
A2. Low, radical leaves oblong-lance, silky above. Pedicels and silicles glabrous.	*australis.*
A3. Stems mostly short.	
b. Stellate-hairy.	
c. Leaves obovate, oblong. Flowers small; on long naked peduncles.	*brackenridgei.*
c2. Leaves linear, obtuse.	*saffordi.*
c3. Leaves lanceolate to ovate. Erect or branching. Silicles twisted when ripe.	*incana.*
c4. Leaves oblong. Ripe silicles twisted on long pedicels.	*gillesii.*
b2. Silky-hirsute, ovate-lanceolate leaves.	*falklandica.*
b3. Glabrous.	
c. Leaves linear-lanceolate, ciliate-toothed.	*funiculosa.*
c2. Cespitose. Leaves fasciculate, narrow.	
d. Leaves long, acutish.	*graminifolia.*
d2. Leaves narrow-linear, subobtuse.	*oligosperma.*
c3. Fleshy.	
d. Leaves orbicular to obovate, toothed or incised.	*karraikensis.*
d2. Leaves oblong linear, often ciliate, margined.	*monantha.*
A4. Stems several, leafy; leaves glabrous.	
b. Leaves long-spatulate to oblong-linear.	*depilis.*
b2. Leaves oblanceolate, subterminally rosulate. Flowers crowded, bracted.	*hatcheriana.*
b3. Leaves pinnatifid, toothed and ciliate.	*patagonica.*

1. DRABA AUSTRALIS AMEGHINOI Speg. (*D. ameghinoi* Speg.)

(*Drabella.*) Small, hirsute annual, with rosulate, elliptic leaves, or obovate, *stellately pubescent*, entire. *Scapes* simple, or forked at the base, leafy, stellately hairy below, naked above. *Flowers* spicately racemose, green, with few simple hairs; *petals* none. *Silique* large, elliptical, with small, simple hairs. (More robust than *D. argentea*, and distinguished by its hairy silique.)

Patagon., stony planes by Golfo de San Jorge.

2. D. ARGENTINA Speg.

(*Drabella.*) Small, hirsute annual. *Leaves* chiefly rosulate, lanceolate to nearly ovate, acute-rounded above, attenuate below, sessile, entire, rough, with white spreading, stellate *hairs*. *Scapes* simple or branching, slender, glabrous, but with some stellate hairs, naked above. *Flowers* racemosely spicate, very small, white, glabrous. *Silique* glabrous, rather large, elliptical, on a smaller pedicel.

(S. Argent., near Bahia Blanca); Patagon., by Golfe de San Jorge; by Rio Sta. Cruz.

D. ARGENTINA GRANDIFOLIA Speg.

Flowers larger, the white petals twice as long as the green sepals.

D. ARGENTINA LATIFOLIA Speg.

Leaves orbicular, or elliptic-obtuse, margin obsoletely repand.

3. D. AUSTRALIS Hook. f.

Low annual, with subsimple *stem*, few radical *leaves* rosulate, oblong-lanceolate, entire, obtuse, with silky, simple *hairs* on epiphyl, and stellate hairs on hypophyl. *Flowers* white. *Pedicels* in fruit filiform, half as long as the linear-oblong *silicle*. Peduncles and silicles glabrous.

Bahia Blanca to Patagon., Rio Sta. Cruz, Puerto Madryn; N. and E. Fuegia (Ansorge, Dusén, Hatcher).

4. D. BRACKENRIDGEI A. Gray.

Stem short, 2–5 cm., divided from the perennial root, stellate-hoary. *Leaves* crowded, obovate, oblong, obtuse, 5 mm. long. *Peduncles* long, naked; racemes dense. *Flowers* small, white. Silicles oblong to lance-elliptical, hairy. *Style* short. *Valves* rather plane.

(Bolivia.) Patagonia (?).

5. DRABA CHUBUTENSIS Speg.

Tall, cespitose, all laxly pulverulent-pubescent; hairs all stellate. *Leaves* as fascicled innovations, oblanceolate, proportionally large, entire, long attenuate-petiolate; *cauline leaves* few, larger, elliptical-ovate, entire or repand-toothed. *Scapes* very branching, racemes long, lax; *silicles* on a pedicel 2–3 times their length, glabrous, rather small, plane with a *style* half their length.

Patagon., in elevated places near Teka-choique.

6. D. DEPILIS Phil.

Many-stemmed, long, glabrous. Radical *leaves* long-spatulate; *cauline* rather crowded, oblong-linear, sessile. *Corymbs* many-flowered, dense, scarcely elongating. *Pedicels* short, as long as the flowers. *Petals* twice as long as the sepals, white or with violet. Silicles.

Fuegia, Bahia del Esp. Santo.

7. D. FALKLANDICA Hook. f.

Stem very short, divided. *Leaves* crowded, spreading, ovate-lanceolate, subacute, silky-hirsute. *Peduncle* puberulous, leafless, or from a 1-leaved base. *Flowers* racemose to corymbose, small. *Silicles* elliptic-oblong, 3 times as long as the *pedicels*, hairy; *valves* convex; *style* long.

Falklands.

8. D. FUNICULOSA Hook. f.

Glabrous. *Stem* short, with leafy branches. *Leaves* linear-lanceolate, occasionally opposite and subconnate at the base, their margin ciliate-dentate. *Scapes* slender, few-flowered. *Flowers* small, white; *petals* spatulate, twice as long as sepals. Fruiting *pedicels* short. *Silicles* obtuse at both ends. *Stigma* bifid.

Falklands. E. Fuegia (Ansorge); Ushuaia.

"Peculiar, near *D. oligosperma* Hook., of Arctic Amer., and *D. lactea* Adams, of Samara." (J. D. Hooker.)

9. D. GILLIESII Hook. & Arn.

Perennial, with ligneous root. *Radical leaves* in a rosette, oblong, obtuse, with stellate hairs; *cauline leaves* oblong-linear, subacute, sessile, dentate. *Flowers* corymbose, afterwards racemose. *Sepals* villous; *petals* twice their length. *Silicle* (without the style) as long as the pedicel, at first villous, afterwards smooth, and torted. *Style* 3–4 mm., *stigma* capitate. The mature *fruit* has pedicels 3–4 times as long as the silicles.

(Perhaps = *D. magellanica* Lam.)

(Chillan and Valdivia); Chubut, in the mountains at Bolson.

10. DRABA GRAMINIFOLIA Speg.

Glabrous, cespitose, stoloniferous, 10–14 cm. high. *Leaves* fasciculate at ends of the branches, acutish, attenuate to a long petiole; the base sheathing. *Scapes* stout, lax-racemose. Lower *pedicels* with a leaf; upper naked. *Silicles* lanceolate, or narrow-elliptical. *Stigma* subsessile.

S. Patagon., rocks near Lago Argentino, at Karr-aike.

11. D. HATCHERIANA Gilg, n. s. (Plate XVIII, B.)

Low cushion-like perennial, with thick multicipital root, and short branches covered by the remains of withered leaves. Leaves rosulate at the ends of the branches, oblanceolate, acute, cuneato-angustate downwards, coriaceous-fleshy, obsoletely ciliate on the margin. Flowers apparently whitish, subcapitately crowded in dense 10–30-flowered racemes; on a short leafless scape, but with largish bracts at base of the pedicels. Sepals reddish, broadly obovate, apically rounded. Petals half exceeding the sepals, narrow-unguiculate below, orbicularly obovate, and apically rotundate. Ovary broad obovate, compressed. Style short, thick; stigma capitate.

S. Patagonia, by Rio Coy Inlet (collected by Hatcher, Nov., 1896, and dedicated to him on the occasion of his decease, July 3, 1904).

The following is Professor Gilg's diagnosis:

DRABA HATCHERIANA Gilg n. sp. (Plate XVIII, B.)

Perennans humilis pulvinaris radice crassa multicipite, ramis brevibus vel brevissimis ascendentibus reliquiis foliorum emarcidis densissime obtectis; foliis apicem ramorum versus densiuscule vel dense rosulatis, oblanceolatis, apice acutis, basin versus sensim longe cuneato-angustatis, coriaceo-carnosis, margine hinc inde obsolete ciliatis; floribus verisimiliter albidis in racemos densos vel densiusculos 10–30-flores subcapitatos collectis, scapo brevi nudo, sed bracteis euphylloideis majusculis ad pedicellorum basin evolutis; sepalis rubescentibus, late obovatis apice rotundatis; petalis quam sepala plus sesquilongioribus, in parte 2/5 inf. anguste unguiculatis, superne valde dilatatis orbiculari-obovatis rotundatis; staminibus normalibus; ovario late obovato, crassiusculo, conspicue compresso; stylo brevi, crasso, stigmate capitato.

The plant rises like a cushion, about 2–2.5 cm. above the ground. Its rosette-leaves are 12–13 cm. long, at their upper part about 1.5–2 mm. broad. The inflorescence is on the whole about 1.5 cm. high, of which the flowerless part comprises 1–1.1 cm. The bracts are 3–5 mm. long, 1 mm. broad. The pedicels are about 3 mm. long. The calyx-leaves are 2.5 mm. long, nearly of the same breadth. The petals are about 4 mm. long, in the upper part 2.5 mm. broad.

"This new species appears to me to be closely allied to *Draba spegazziniana* Dusén (Gefasspflanzen der Magellanslander, p. 177.) = *Draba oligosperma* Spegazzini. Probably it does not belong to the genus *Draba;* but so long as we are unable sharply to define the generic limits of the South American species of Cruciferæ I insert it provisionally in *Draba.* It does not belong to *Braya.*" (Ernst Gilg.)

12. DRABA INCANA Linn.

Perennial or biennial, erect, simple or somewhat branched, stellate-hairy, 15–30 cm. high. *Leaves* 8–25 mm., lanceolate, or oblanceolate to ovate, acutish to obtuse; toothed or subentire. *Flowers* 2–3 mm. broad. *Petals* white, notched, twice as long as the calyx. *Silicles* oblong or lanceolate, acute, twisted when ripe, on short suberect pedicels. *Style* minute.

Arctic and alpine Eurasia. Cold parts of N. Amer., and by Rocky Mountains to Magellan.

D. INCANA SYLVATICA (Alboff.).

Tender, low, green. *Stem* simple. *Leaves* larger, membranaceous. *Less pubescent* than the type-form, *D. incana.*

Fuegia, valley of Olivaia.

13. D. KARRAIKENSIS Speg.

Glabrous perennial; green-glaucescent, branching. *Leaves* fleshy, orbicular to obovate, crenate, toothed, or incised. *Scapes* leafy, apically spreading, spicate-corymbed. *Silicles* ovate to lanceolate. *Style* long; valves of silicle nerveless. *Stigma* capitellate. *Seeds* 4–7 in each cell, 2-seriate.

S. Patagon., in dry, denuded parts. Mar.–Apr. By San Julian, Golfo de San Jorge to Rio Deseado.

14. D. MAGELLANICA Lam. (including *D. saffordi* Phil. and *D. gillesii,* H. and A.) (Plate XVIII, A., the type-form.)

Perennial, 8–30 cm. high, covered by short appressed hairs. *Radical leaves* in a rosette, oblong, more or less obtuse. *Cauline leaves* sparse, sessile, obscurely dentate. *Sepals* villous, with membranous margins. Silicles villous, shorter than the pedicels, not torted. *Style* short, less than 1 mm.

Magellan Strait, and all Patagonia. *D. saffordi* Phil. got at Gregory Bay, "was apparently established on diseased specimens." (Reiche.) *D. magellanica* varies much, as to height, and stellate hairs of leaves and stem. Coy Inlet (Peterson); Magellan (Hatcher); Fuegia (Dusén).

DRABA MAGELLANICA GLABRATA Gilg.

Stout; silicles glabrous with *pedicels* appressed to the rachis, supported by long stellate hairs; *style* long, persisting.

N. Patagon., at Neuquen, in rocks at Valle Trolope, Neuquen.

D. MAGELLANICA SUBGLABRATA Speg.

Slender. *Silicles* at length glabrate. *Stigma* sessile.

S. Patagon., at Guadales near Rio Sehuen.

15. D. MONANTHA Gilg.

Cespitose perennial, forming cushions. *Leaves* close imbricate, rather fleshy, oblong-linear, acutish, glabrous or mostly ciliolate-margined. *Flowers* solitary, shortly-pediceled. *Sepals* obovate, rounded, glabrous. *Petals* twice as long, narrowed to a claw, toothed-lobed upwards. *Stamens* very unequal. *Ovary* ovate, minute.

Patagon., Sta. Cruz.

D. monantha microphylla Gilg.

S. Patagon., Valley of Upper Gallegos (Nordenskj.).

16. D. PATAGONICA Phil.

Stems several, leafy. Leaves rosulate, oblong, attenuate-petiolate, pinnatifid, toothed, bright green, ciliate. Cauline leaves sessile, entire. Raceme short, crowded. Silicles glabrous, oblong, 3–4 times as long as the pedicels. Stigma sessile.

N. Patagon., near Nahuel-huapi.

17. D. SPEGAZZINIANA Dusén. (*D. oligosperma* Speg. non Hook.)

Small, glabrous, densely cespitose. *Leaves* fasciculate-rosulate, narrow-linear, entire, rather obtuse. *Scapes* long, naked below, above corymbed by spikelets on rather long pedicels, with a rather large bract. *Flowers* small, white. *Capsule* acutely elliptical, the cells 1–2-seeded.

Patagon., Chubut, near Lago Fontana, and Lago Paz; and W. Patagon., by Rio Aysen.

18. SOPHIA Adans. 1735. (*Sisymbrium* Linn. 1735, *Descurainea* Webb. & Barth. 1836.)

Silique linear or linear-oblong; *flowers* on long pedicels, racemed, style mostly short. *Seeds* small, wingless, 1–2-seriate; *cotyledons* incumbent. Annual or biennial herbs, rarely shrubby, with bipinnatifid, or dissected *leaves*, and forked *pubescence*.

Species 12, in the N. Temperate Zone, the Canaries, and the Andes.

KEY TO THE SPECIES.

(The following analysis of the Patagonian forms of this genus is chiefly after Spegazzini.)

- *A*1. Pubescence entirely stellate.
  - *b*1. Stigma long-styled. *deserticola.*
  - *b*2. Stigma sessile.
    - *c*1. Siliques glabrous. *sophia.*
    - *c*2. Siliques stellate-puberulous. *cumingiana.*
- *A*2. Pubescence glandular on the stem, stellate on the leaves.
  - *b*1. Leaves bipinnatifid, lobes subentire. *pinnata.*
  - *b*2. Leaves tripinnatifid, lobes toothed.
    - *c*1. Siliques glabrous. *glabrescens.*
    - *c*2. Siliques stellate-puberulous. *tenuissima.*
  - *b*3. Leaves with glandular and forked hairs intermingled; pinnately parted, the segments multifid. *heterotricha.*
- *A*3. Pubescence entirely glandular. Siliques glabrous. Bipinnatifid. *glandulifera.*
- *A*4. Leaves fascicled at nodes, with forked hairs on under surface; pinnatifid. Siliques very long, vermicular. *subscandens.*
- *A*5. Glabrous or with forked hairs. Leaves dentate to pinnatifid; the lower petiolate, the cauline sessile or auricled. *sagittata.*
- *A*6. Glaucous. Hairs on leaves all stellate; glandular on pedicels and sepals. Leaves bipinnatifid; the segments apically lobed. *glaucescens.*

1. S. CUMINGIANA (Fisch. & Mey. sub *Sisymbrium*.)

Plant ash-colored, with tripinnatifid *leaves*, and dense terminal *racemes*. *Petals* scarcely equalling the sepals. *Pubescence* stellate. *Siliques* as long as the pedicels, stellate-puberulous. *Stigma* sessile. *Seeds* 2-seriate.

(Chili); Patagon., near Lago Argentino.

2. SOPHIA DESERTICOLA (Speg. sub *Sisymbrium*).

Stem prostrate, creeping, 2–8 cm. long, woody, branching apically. *Leaves* densely rosulate on the branchlets, pinnately lobed or cleft, hoary-tomentose, the hairs all stellate. *Flowers* 2 or many, arising from the rosules, the pedicels 1-flowered, shorter than the leaves. *Sepals* green, sparsely pilose, equalling the white petals. *Siliques* cylindraceous, glabrous. *Style* long. (Allied to *S. canescens*, but the structure of leaves and flowers and the *persistent caudex* are distinctive. Speg.)

Patagon., by Port Rawson; in dry places between S. Julian and Rio Deseado.

3. S. GLABRESCENS Speg.

Green slender annual. *Stems* and branches glabrous, glandulose upwards. *Leaves* bipinnatifid, their lobes minute, obovate, obtuse; with few, minute, stellate *hairs*. *Petals* ochroleucous, smaller than the sepals. *Silique* glabrous with subsessile style. *Pedicels* glabrous, 2–3 times shorter than the flowers. *Pubescence* glandular on the stem; stellate on the leaves.

Patagon., by R. Sta. Cruz; Port Rawson, by Rio Negro.

4. S. GLANDULIFERA Speg.

Slender annual, with glandular-capitate hairs. *Leaves* twice pinnatifid. *Petals* yellow, longer than the sepals. *Siliques* glabrous, 2–3 times longer than the pedicels, and crowned by the subsessile *styles* (any stellate pubescence?).

S. Patagon., in fields by Rio Chico de Sta. Cruz.

5. S. GLAUCESCENS (Phil.).

Seagreen perennial, covered with short villi. *Leaves* sparsely covered with only stellate hairs, bipinnatifid, the segments 1.5–2 mm. broad, apically lobulated. *Pedicels* and *sepals* glandular-hairy. *Calyx* scarcely 2 mm. long, equal to the petals. *Siliques* spreading, coriaceous, 2–3 times as long as the peduncles.

Patagon., by Teka-choique.

6. S. HETEROTRICHA (Speg. sub *Descurainea*).

Simple erect annual, 25–50 cm. high. Stem terete, all hispid-glandular. *Leaves* erect, appressed, lanceolate, pinnately parted, 5–9 pairs of alternate lobes, approximate, lanceolate, acute, multifid, with short acute lobules, all tomentose with glandular and stellate hairs intermixed, green, somewhat hoary. *Raceme* long; pedicels hispid-glandular. *Sepals* glabrous or sparsely glandular-hairy, ovate, green with whitish margins; *petals* spatulate, white, slightly exsert. *Siliques* glabrous, linear, attenuate both ways, at first erect-appressed, afterwards horizontally spreading, slightly longer than the pedicel. *Style* subsessile. *Seeds* 2-seriate.

Chubut; in dry hills near Lago Cholila and by Carren-leofú.

7. SOPHIA PINNATA (Walt. sub *Erysimum*) Britt. (*Sisymbrium canescens* Nutt. *Descurainea canescens* Prantl.)

Densely canescent; the *pubescence* glandular in the *stem,* stellate in the *leaves.* *Stem* erect, 20–60 cm. tall, slender; branches ascending. *Leaves* 5–10 cm. long, oblong, bipinnatifid; lobes many, entire, obtuse. *Pedicels* slender, at length spreading horizontally, 10–14 mm. long, exceeding the flattish siliques. *Style* minute. *Seeds* 2-seriate. Petals pale yellow.

(N. and S. Amer.); Magellan. S. Patagon., by O. A. Paterson, near Coy Inlet. fruiting Nov. 13, 1896; the flowers bright yellow. N. & E. Fuegia, Dusén, only on the steppes and in cultivated places.

Port San Julian to Rio Deseado.

S. PINNATA PATAGONICA (Speg. as *Descurainea canescens*).

"All the *hairs* only stellate, more or less hoary. *Seeds* always 2-seriate in my specimens." (Speg.)

All Patagonia.

S. PINNATA PURPUREOLA (Speg. as *Descurainea canescens*).

Leaves 2–3-pinnately parted, green-purpurascent. Low with dense stellate-branching *hairs.*

Patagon., between San Julian and Rio Deseado.

8. S. SAGITTATA Hook. & Arn.

Suffruticose, tall. *Leaves* membranous, oblong, more or less dentate, the lower sometimes all pinnatifid, their margins ciliate, the cauline sessile, and auricled-amplexicaul. *Racemes* many or few-flowered, the lower approximate to the leaves. *Petals* white or rose, the same size as the sepals. Silique longer, to 44 mm., slightly arched; valves with a nerve and its ramifications. *Stigma* sessile. *Seeds* 1-seriate.

(Atacama Province); through central and andine Patagonia. Greatly varying. The following forms are given:

(*a*) *andina;* green, mostly glaucescent, glabrous. S. Patagon.

(*b*) *ciliata*, *leaves* glabrous, but margin ciliated. Golfo de San Jorge.

(*c*) *communis; basal leaves* dentate-subruncinate; cauline subentire. *Flowers* few. At Sta. Cruz.

(*d*) *exauriculata*, *leaves* without auricles. Near Rio Chico.

(*e*) *glauca*. Herbaceous, tall, glabrate. *Basal leaves* oblanceolate, angulate-repand; cauline linear, entire. By Rio Gallegos.

(*f*) *latifolia;* pale green, mostly glaucescent glabrous, *lower leaves* pinnately lobed, the cauline with broad, fleshy auricles. Lago Blanco and Rio Aysen.

(*g*) *normalis;* hairs stellate; plant obscurely green, not succulent. S. Patagon.

(*h*) *pubescens;* intensely green, lowest *leaves* glabrous, upper subtomentose, not ciliated, all the *hairs* stellate. Valle Hermoso.

(*i*) *purpurascens;* woody and rigid. *Lower leaves* acutely sinuate-toothed, purplish underneath. Patagon., by Rio Chico de la Sta. Cruz.

9. SOPHIA SUBSCANDENS Speg.

Some meters high; stems weak, subscandent, glabrous, nodose. *Leaves* fascicled at the nodes, subspatulate, coarsely and sparingly pinnate-lobed; the margin or also the under surface pilose with forked *hairs*. *Inflorescence* few-flowered. *Siliques* vermicular, very long, divaricate, briefly pediceled; their apex attenuate-stigmatose.

N. Patagon., in shrubberies near Carmen de Patagones. Root white; nodes, 30–40 cm. long, many-headed at top. Climbing branches, 80–150 cm., slender. Flowers unknown.

10. S. TENUISSIMA (Phil. sub *Sisymbrium*).

Annual, with erect *stem* to 30 cm. tall; and short, glandular-hirtellous *hairs*. *Leaves* hoary, tripinnatifid, the segments short, obtuse, narrow. *Peduncles* capillary; *racemes* lax. *Flowers* minute, yellow; *petals* scarcely exsert from the calyx; style slender, shorter than the narrow silique. Pubescence glandular on the stem, stellate on the leaves, calyx and fruit.

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Patagon., by Golfo de San Jorge; and by Rio Chubut.

"The Patagonian specimens have 2-seriate seeds; the Chilian (fide Reiche) only 1-seriate." (Speg.)

19. ARABIS Linn. (including *Turritis* L.).

Herbs with entire or lobed *leaves* and white or purplish *flowers*. *Siliques* linear, long, flat, the valves mostly 1-nerved (in the following 3-nerved), not dehiscing elastically. *Stigma* 2-lobed or subentire. *Seeds* in 1–2 rows, flat, often margined or winged. *Cotyledons* accumbent.

Species more than 100, Northern and Mediterranean; some in S. Amer.

1. A. MACLOVIANA Hook.

Glabrous. *Leaves* radical, long-petiolate, oblong-obtuse, serrate-toothed below, small and narrow upwards. *Flowers* corymbose, white. *Silique-valves*, 3-ribbed.

Falklands, on the coast; Magellan.

(*A. magellanica* sub *Hesperis.*)

20. ALYSSUM Linn.

Low, branching, *stellate-pubescent* herbs, with small, racemose yellowish or white flowers. *Filaments* often dilated and toothed. *Silicles* ovate, nerveless. *Stigma* subentire. *Seeds* 1 or more in the cells. *Cotyledons* accumbent.

Species 100, chiefly in the Mediterr. region.

A. MARITIMUM Linn.

Procumbent undershrub. *Leaves* linear-lanceolate, acute, slightly hoary. *Petals* obtuse, white. *Filaments* toothless. *Silicles* oval, glabrous; their cells *1-seeded*. *Style* short.

(Mediterr., in sandy places by the sea); Patagon., near Rawson (Dusén).

21. BRAYA Sternb. & Hoppe.

Cespitose scapigerous perennials, with multicipital root, narrow radical leaves, and white, or pink, or purple flowers, often subtended by leafy bracts. Sepals subequal. Silique ovate to linear, the valves convex, stigma capitate, slightly 2-lobed. Seeds 2-(rarely 1-) seriate, many or few, marginless. Cotyledons incumbent.

The capsule is intermediate between the Siliquosæ, as *Arabis*, and the Siliculosæ, as *Draba*.

(*B. uniflora* Hook. f. & Thou. growing in Thibet at 4,500 meters of elevation, has connate sepals, a unique case in this family of 1,500 species.)

Species 12, in cold parts of all continents. Members of this genus belt the world, from Eur. Alps, by Thibet, Himalayas, Siberia, Arctic regions, to Chili, Patagon. and N. Zeal.

Key to the Species.

A. Leaves narrow-linear, acute, margin pectinate-spinulose. Peduncle short.	*lycopodioides.*
A2. Leaves ovate-obtuse, rather small, similar.	
b. Forming cushions. Leaves ciliate, silvery. Flowers sessile.	*glebaria.*
b2. Branches crowded. Peduncle as long as the leaves.	*patagonica.*
A3. Leaves ovate-linear, acute, pectinate-ciliate, all similar. Flowers sessile.	*pectinata.*
A4. Basal leaves spatulate-linear, fleshy, hispid to ciliate. Stem-leaves scanty or none. Flowers racemed.	*pusilla.*
A5. Leaves small, triangular-ovate; stem-leaves smaller; large leaves enclosing the solitary flower. Peduncle short.	*pycnophylloides.*

1. BRAYA GLEBARIA Speg.

Robust perennial with rather large *caudex*, and crowded branches making hemispherical cushions. *Leaves* densely imbricate, small, ovate, obtuse, all isomorphous, densely fimbriate-ciliate on their margin, cinereous silvery. *Flowers* largish, acrogenous, solitary, sessile. *Sepals* elliptic-elongate, oblong-obtuse, glabrous, saccate and green at the base. *Petals* ochroleucous, exceeding the sepals, spatulate. *Silicles* unknown.

Chubut, in basalt rocks near Lago Musters and Choique-lauen.

2. B. LYCOPODIOIDES Speg.

Subdichotomously branching, creeping, erect at apex. *Leaves* rather large, narrow-linear, acute, coarsely keeled, the margins aculeolate-pectinate, all similar. *Flowers* apical. *Silicle* rather large, obovate to broad lanceolate. *Peduncle* not exceeding the uppermost leaves.

S. Patagon., on dry plains near Rio Chico de Sta. Cruz; between San Julian and Rio Deseado.

B. LYCOPODIOIDES CONTRACTA Speg.

Branches short and densely crowded. By Rio Deseado.

3. BRAYA PATAGONICA Speg.

Branches short, erect, crowded. *Leaves* rather small, ovate, obtuse, all similar. *Silicle* mediocre, broad-elliptical. *Peduncle* slightly surpassing the highest leaves.

Patagon. On dry table-land at Karr-aike, by Lago Argentina.

4. B. PECTINATA Speg.

Cespitose-crowded, compact, forming hemispherical cushions. *Leaves* rather large, ovate-linear, acutish, dorsally convex, not or obsoletely subcarinate, their margins pectinate-ciliate, all isomorphous. *Flowers* apical, solitary, subsessile; *sepals* green, subgibbous at base; *petals* white. *Silicles* unknown.

S. Patagon., in rocks near Ultima Esperanza.

5. B. PUSILLA A. Gray.

The root sends up simple shoots, with radical spatulate, linear *leaves*, somewhat fleshy, hispid or ciliate on the margins. *Stem-leaves* scanty or none. *Raceme* 5–6-flowered. *Siliques* linear or linear-oblanceolate, twice as long as the pedicel, about 8 *seeds* in each cell. *Styles* very short.

Patagon. Cordilleras, in deep snow. J. B. Hatcher in S. Patagon. (?)

6. B. PYCNOPHYLLOIDES Speg.

Dense; the branches short, erect. *Leaves* very small, triangular-ovate, the cauline smaller and silvery; the subfloral broader, pale. *Flowers* solitary, terminal, on short pedicels; girdled by a cup of leaves. *Silicles* rather small, obovate-lanceolate.

Patagon., in dry precipices at Orr-Aike, near Lago Viedma.

22. HESPERIS Linn.

Erect, perennial or biennial herbs, with forked *hairs*, simple *leaves* and large *racemose*, purple or white *flowers*. *Stigma* with 2 erect lobes. *Siliques* elongated, nearly cylindric, with 1-nerved valves. *Seeds* in 1 row in each cell, wingless. *Cotyledons* incumbent.

Species 20, Eurasiatic.

H. MAGELLANICA (Pers. sub *Brassica;* Hook. f. sub *Sisymbrium*) O. Ktze.

Erect, branching above. *Leaves* ovate-oblong, acute, pinnately lobed, attenuate-petiolate, the lobes sinuate-dentate, acute. *Racemes* corymbose, becoming elongate in fruit. *Pedicels* bractless, spreading. *Siliques* suberect, terete, linear-oblong, attenuate to a short style, rather short, bearded with stellate *hairs.* *Septum* 1-nerved. *Seeds* many, oblong, rufous, sulcate.

Patagon., at Cabo Negro; Magellan; Fuegia, a steppe-plant (Dusén) "Glabrous," Hook. f.; "Plant covered with stellate hairs," O. Ktze.

Family 45. CAPPARIDACEÆ. Caper Family.

Mostly herbs with alternate, simple or palmate *leaves* and 4-merous regular, hypogynous *flowers.* *Petals* free, sessile or clawed, rarely none. *Stamens* 6 or more, not tetradynamous, hypogynous. *Ovary* sessile or stiped, 1-celled, or falsely 2–8-celled. *Ovules* many, on parietal *placentæ.* *Fruit* a capsule or berry.

Species 300, chiefly in warm countries.

ATAMISQUEA Miers.

Rigid, branching shrub, lepidote. *Leaves* linear, oblong, small. *Flowers* solitary or paired, terminal, with slender pedicels. *Sepals* 2, ovate, valvate, and 2 inner small. *Petals* 4, unequal, linear. *Stamens* 6, with 3 or 6 staminodes. Dry stipitate *berry*, 1–2-seeded.

Only species:

A. EMARGINATA Miers.

Leaves emarginate at both ends, green above and shining; hirsute and hoary below.

(*Capparis atamisquea* by O. Ktze., who says "non *Capparis emarginata* auct." and that there are species of *Capparis* with few stamens; which character is therefore not a sufficient ground for a separate genus.)

(Chili; Argentina); Patagonia, rather rare in shrubberies along Rio Negro. *Mata negra* of the inhabitants; its wood in burning emits a smoke that is hurtful to both eyes and nose.

Family 46. RESEDACEÆ. Mignonette Family.

Herbs with unsymmetrical, 4–7-merous *flowers* and alternate *leaves* having glands for stipules. *Terminal racemes or spikes.* *Calyx-leaves* narrow, and petals unequal, mostly laciniate. Hypogynous *disk* bearing the 3–40 *stamens.* *Capsule* 1-celled, with parietal *placentæ*, 3–6-lobed and horned, opening apically before the reniform seeds are ripe.

Species 70, chiefly in the Mediterranean region.

RESEDA Linn.

Small *spikes* or contracted *racemes.* *Petals* 4–7-cleft, unequal. *Stamens* 12–40, on one side of the flower.

Species 55.

R. ODORATA Linn. Mignonette.

Leaves cuneate, 3-lobed with obtuse lobes, or entire. *Petals* deeply partite, longer than the sepals. *Capsule* slightly contracted at the mouth, *Seeds* large. *Flowers* fragrant.

(North Afr. & cult.)

R. ODORATA PILOSA O. Ktze.

Stems subpilose.

Patagonia (M. & T.; only cult. or escaped).

Family 47. DROSERACEÆ. Sundew Family.

Glandular pubescent herbs mostly with rosulate *leaves*, their *glandular hairs* sensitive; and perfect flowers, usually in *racemes.* *Caylx* 4–8-merous; *petals* 5, hypogynous, convolute, distinct, or nearly so. *Stamens* 4–20. *Ovary* 1–3-celled; *styles* 1–5. *Seeds* numerous; *endosperm* fleshy.

Species 125, widely distributed.

DROSERA Linn.

Bog-herbs, with 4–8 *stamens*, 1-celled *ovary*, and glandular-pilose *leaves.* *Styles* usually 3.

Species 110, nearly cosmopolitan; most in Australia, but none in the Pacific Is.

D. UNIFLORA Willd.

Minute, *stemless.* *Leaves* rosulate, spatulate, with rounded lamina. *Scape* short, strong, 1–more-flowered. *Flowers* showy. E. and W. Magellan. Falklands. Staaten I., S. Fuegia. (Bolivia.)

D. uniflora W., *D. arcturi* Hook., and *D. stenopetala* Hook., appear to J. D. Hooker to be three single-flowered species, representing each other in extreme southern regions, being found in Patagonia, Auckland Island, and Tasmania.

Family 48. CRASSULACEÆ. Stonecrop Family.

Mostly succulent herbs or shrubs, with simple exstipulate *leaves* and cymose or solitary regular and perfect, 4–5-merous *flowers*. *Stamens* hypogynous, as many as the sepals, or twice as many. *Floral* symmetry otherwise complete. *Seeds* in the *follicles* numerous, with fleshy *endosperm*.

Species 300, widely dispersed.

CRASSULA Linn.

Leaves opposite, entire, mostly glabrous. *Flowers* symmetrically 4–5 merous. *Calyx* and *stamens* shorter than the corolla. *Petals* free or united at base. *Follicles* distinct.

Species 120, most in S. Africa and Chili; some in Eur. and N. Amer., Orient., Austral. and N. Zeal.

The Patagonian species are chiefly of the section *Tillæa*, taken by some as a genus, having sagittate leaves.

1. C. MAGELLANICA (Wild.).

Stem creeping. *Leaves* oblong, imbricate.

Magellan.

2. C. MOSCHATA Forst. (d'Urv. sub *Bulliarda; Tillæa* DC.).

Small, creeping, aquatic annuals, with opposite, succulent, ovate-oblong, connate *leaves;* and sessile 4-merous *flowers* in the upper axils.

N. Patagon., at Rio Negro; E. and W. Magellan; Fuegia to Cape Horn; Falklands; also in Kerguelen-land; "always growing near the sea, where streams enter."

3. C. PEDUNCULARIS Succ.

Stem erect, simple. *Leaves* subconnate, lanceolate, acute. *Pedicels* axillary, solitary, twice or three times as long as the leaves. *Carpels* truncate at apex.

(Moist regions about Buenos Aires and Monte Video); N. Patagon., by Rio Negro.

4. C. TILLÆA (Miers) (*Tillæa minima* Hook. & Arn.).

Annual, with slender, subsimple *stem*, naked below. *Leaves* ovate, connate, acute or subobtuse, thickish. *Flowers* subsessile, and peduncled, 4-merous. *Calyx-segments* ovate, acute, exceeding the petals. *Follicles* 1–2-seeded.

(Calif., Chili); N. Patagon.

Family 49. SAXIFRAGACEÆ. Saxifrage Family.

Herbs or shrubs, with exstipulate *leaves*, and regular, mostly perfect, and mostly perigynous or superior *flowers*, with *stamens* as many or mostly twice as many as the petals; and the *carpels* are usually fewer (mostly 2), connate below, with diverging apex and *styles*. *Fruit* a capsule or berry. *Seeds* numerous, with copious endosperm. (Occasionally apetalous.)

Species 600, chiefly in cold and temperate regions.

KEY TO THE GENERA.

A. Herbs or shrubs of varying habit. Leaves mostly alternate, extipulate. Flowers 5-, rarely 4-merous. Carpels 2, rarely 3–4, partly connate, 1–2-celled, usually more or less inferior.

b. Stamens hypogynous or perigynous or epigynous; in the last case separate from the style.

c. Placentæ central. Leaves entire or lobed, or palmately parted, sometimes with stipuliform growths. Petals narrow below. Stamens usually 10. 1. *Saxifraga*, p. 457.

c2. Placentæ parietal. Floral disk circular, adnate to the ovary. Petals none. Small marsh plants. Stamens 8–10 (rarely 4–5). 2. *Chrysosplenium*, p. 460.

b2. Stamens 2–3, epigynous, on a disk close to the style. Small cespitose plants, with thick linear leaves and terminal flowers. 3. *Donatia*, p. 460.

A2. Woody plants with simple, mostly opposite leaves, and 5–4-merous flowers (the stamens twice as many) in corymbs. Ovary more or less inferior, 3–5-celled. Marginal flowers sterile, with enlarged, showy sepals. Fruit a capsule. Styles 3–5, free. 4. *Hydrangea*, p. 460.

A3. Woody plants with simple, alternate, often coriaceous and glandular, serrate leaves. Stamens as many as the petals. Ovary with many erect seeds.

b. Ovary superior, 3-celled. Petals contorted. Creeping branched shrub, with short densely-leafy branches and spatulate leaves having trigonal points. 5. *Tribeles*, p. 461.

b2. Ovary inferior, 3–2-celled. Petals long, imbricated. Trees or shrubs with coriaceous leaves. 6. *Escallonia*, p. 461.

A4. Shrubs with simple, often lobed, alternate leaves; racemose flowers, and inferior, 1-celled ovary, with 2 parietal placentæ; becoming a berry. 7. *Ribes*, p. 465.

1. SAXIFRAGA Linn., Saxifrage.

Chiefly perennial herbs, with 5-merous flowers, stamens 10 (very rarely 5). Ovary 2-celled, the apex and styles diverging. Seeds with axile placentation.

Species more than 200, mostly N. Temp. and Arctic; a few in the Himalayas, China, Orient, Algeria, the Andes and Patagonia.

KEY TO THE SPECIES.

A. Scape 1-flowered.

b. Stamens 5.

c. Leaves orbicular-spatulate, 3–5-nerved. *alboffiana.*

c2. Leaves narrow-linear-spatulate, 1-nerved, apically bicuspidate. Petals 5–10. *bicuspidata.*

b2. Stamens normally 10. Petals long.

c. Radical leaves trifid; cauline undivided, linear. *cæspitosa.*

c2. Leaves spatulate, rarely 3-lobed. *S. cæspitosa magellanica.*

A2. Flowers corymbose to paniculate. Lower leaves cuneately 3-cleft; upper often entire. Stigmas large. *cordillerarum.*

1. SAXIFRAGA ALBOFFIANA F. Kurtz.

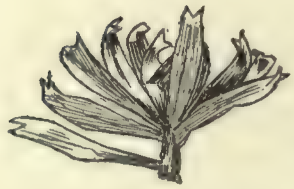
Low, green, glabrous. Roots numerous, long and slender, stoloniferous. *Stems* 1–2 cm. high, branching little, apically rosulate. Flowering stems higher, few-leaved, 1-flowered, with rhomboid, ovate bracts. *Leaves* orbicular-spatulate, entire, with 3–5 nerves converging upwards. *Petals* 2–3, unequal, lingulate, whitish, minute. *Stamens* 5, shorter than the calyx. *Seeds* reniform.

Fuegia at Ushuaia, alpine; W. Magellan, Desolation I. (Dusén).

2. S. BICUSPIDATA Hook. f.

Laxly cespitose, glabrous. *Stems* decumbent, slender, sparingly branching, leafy. *Leaves* 4–8 mm. long, narrow-linear-spatulate, 1-nerved, apically bicuspidate. *Peduncle* axillary, naked, 1-flowered. *Calyx-lobes* apically bifid. *Stamens* 5. *Petals* 5–1(–0). *Calyx* semisuperior.

FIG. 73.



Saxifraga bicuspidata. Young shoot, showing the scattered, bicuspidate leaves. (Original.)

W. Magellan, at Puerto Angusto (Dusén); S. Fuegia, Patagon. (Of habit of *S. oppositifolia* L. of Greenland, except its scattered leaves (Fig. 73). The figure in *Flora Antarct.* incorrectly gives its leaves as opposite.) By Hatcher in Cordilleras of S. Patagon. Determined by the Kew Herbarium, with the following note: "Add to description in Fl. Antarct. ii. 281, Petalum unicum, oblongo-lanceolatum, acutum, 2 mm. longum, 0.5 mm. latum. T. A. Sprague, Nov. 30, 1901."

3. SAXIFRAGA BICUSPIDATA PAVONII (Don).

Cespitose. *Stem* 3–5-flowered. Lower *leaves* deltoid-cuneate, trifid.

S. Patagon.; Mts. near Lago Argentino.

4. S. CÆSPITOSA Linn.

Radical *leaves* crowded, trifid; cauline distant, undivided, linear. *Stem* 1-flowered. *Ovary* inferior, viscid. Pubescence short, glandular. *Calyx-lobes* obtuse; *petals* obovate, elongate.

(Arctic and alpine Eurasia and N. Amer.)

S. CÆSPITOSA BRACHYPHYLLA Wedd.

Scapeless. *Leaves* smaller than in the type, all shortly trifid, the limb densely villous. *Inflorescence* 1–3-flowered, subsessile amid the uppermost leaves of the caudex.

Patagon.

S. CÆSPITOSA MAGELLANICA (Poir) Wedd. (*S. cordillerarum magellanica* Poir.)

Stems cespitose, procumbent. *Leaves* spatulate, rarely 3-lobed at their apex. Flowering branches short, axillary, naked, 1-flowered. *Calyx* glabrous, its lobes linear-obtuse to obovate, much shorter than the petals. *Root* perennial.

Patagon., Chubut; Magellan (Hatcher, Speg.); Fuegia, passim (Dusén).

4. S. CORDILLERARUM Presl. (*S. exarata* Hook. f.)

Cespitose; somewhat pilose-viscid. *Upper leaves* often entire; *lower* cuneately 3-cleft, thick-nerved. *Calyx-lobes* ovate-oblong, shorter than the tube. *Petals* ovate, nervous, white, exceeding the calyx. *Stigmas* large, subspatulate.

(Eur., Alps; Peru.) Magellan (R. O. Cunningham); S. Patagon., in Cordilleras (Hatcher); Fuegia, on mts.

S. CORDILLERARUM BREVISCAPA (Hook. f.).

Densely cespitose. The *flowers* subsessile.

Magellan. Fuegia, to nearly 2,000 m.

2. CHRYSOSPLENIUM Linn.

Low semiaquatic herbs with petiolate, broad, crenate *leaves*, and perfect, minute, greenish flowers. *Calyx-tube* obconic, adnate to the ovary. *Petals* none. *Stamens* 8–10 (rarely 4–5). *Ovary* 1-celled. *Styles* 2.

Species 15, in N. Temperate region, and Extra-trop. S. Amer.

1. C. MACRANTHUM Hook.

Creeping, glabrous. *Leaves* opposite, ovate-cordate, obtuse. *Peduncles* terminal, bracted, 3-flowered. *Flowers* rather large, 2–3-carpellary, the mid-flower sessile.

E. & W. Magellan; Fuegia to Cape Horn.

2. C. VALDIVIANUM Hook.

Creeping, glabrous. *Leaves* opposite, oblong-rotundate, obscurely sinuate, subtruncate at base.

(Valdivia, in Chili); Fuegia, near Cape Horn.

3. DONATIA Forst.

Mosslike, cespitose herbs, glabrous and fleshy, with short, compact branches, narrow, alternate, imbricating entire *leaves*, and white, solitary, sessile, terminal *flowers*, often unisexual. *Calyx-tube* adnate, bearing a subulate bractlet and remote subulate segments. *Petals* about 8, linear, white, inserted on the calyx-tube. *Stamens* 2–3 (–4) epigynous, extrorse. *Styles* 2–3, stigmas globose.

Species 2, one in Tasmania and N. Zeal., the other in S. Chili to Cape Horn.

D. FASCICULARIS Forst.

Stamens 3, alternating with 3 diverging styles.

(Fig. in Eng. & Prantl, iii. 2a. p. 67, A–C.)

S. Chili; Chonos Archip. Fuegia. "Abundant as a *bog-plant*, in green patches, having with it *Acæna pumila*, *Gentiana patagonica* or *G. gracilis*, *Drosera uniflora*, and *Tetroncium magellanicum*." "*Fruit* capsular, rather fleshy; circumscissile, with few (1–3) globose *seeds* in each locule." (Speg.)

4. HYDRANGEA Linn.

Shrubs or trees, with opposite, simple *leaves*, 4–5-valvate *petals*, 8–10 *stamens*, inferior *ovary* and capsular *fruit*. *Some of the flowers* may be *sterile* and *apetalous*, with showy, petaloid calyx-divisions, chiefly in the margins of the corymbs.

Species 35, Himalayas, E. N. Amer. and S. Amer.

HYDRANGEA INTEGERRIMA (Hook. & Arn. sub *Cornidia*).

Large tree, with *evergreen*, coriaceous entire leaves; and no sterile flowers. *Carpels* 3, becoming separate; *seeds* minute, numerous. Branches with special involucre.

S. Chili to Chronos Archip.

H. SCANDENS.

Climbing shrub.

W. Patagon. (Dusén.)

5. TRIBELES Phil. (*Chalepoa* Hook. f.)

Creeping, smooth shrubs, with short leafy branches, and alternate, imbricating *leaves*, 3-angled at the apex. *Flowers* small, white, terminating the branches (solitary or racemose?). *Petals* 5; *stamens* 5, hypogynous, *anthers* globose, extrorse. *Carpels* 3, united in a superior, indehiscent *ovary*.

Only 1 species, viz:

T. AUSTRALIS Phil. (*Ch. magellanica* Hook. f.)

Leaves evergreen, oblong-cuneate, 12 mm. long, a tuft of dry ones at base of the branchlets, and of green ones at the apex; tip of leaves 3-toothed.

(S. Chili); Patagon., Fuegia to Cape Horn.

T. philippi (Hook. f. sub *Chalepoa*) is only a synonym of *T. australis*. It differs by the length of the peduncle, which is given as only 6 mm. in *T. australis* and as 10–15 mm. in *T. philippi;* but the flowers are nearly sessile in their early stages. (Franchet.)

This genus once referred to Pittosporaceæ is now separated, because of the absence of resin-ducts, and is placed in Saxifragaceæ because of its likeness to *Escallonia*. (Engl. & Prantl.)

6. ESCALLONIA Linn.

Trees or shrubs with angled branches, and alternate, evergreen *leaves*, and *5-staminate*, *1-styled flowers*, having a 2–3-celled inferior *ovary*.

Species 50, in the Andes and S. Brazil.

KEY TO THE SPECIES.

A. Leaves narrow. Flowers chiefly axillary.
  b. Leaves linear. Stems procumbent. Racemes long. *uliginosa.*
  *b*2. Leaves linear-lanceolate. Branches glabrous. *alpina.*
  *b*3. Leaves small, lanceolate, serrate. Branches winged and ciliate. *pterocladon.*
  *b*4. Leaves small, spatulate-lanceolate, serrulate. Young branchlets angular. *rosea.*
*A*2. Leaves spatulate-obovate. Flowers solitary, terminal.
  b. Petals long and narrow. *serrata.*
  *b*2. Petals obovate. Old leafless branches spinelike. *virgata.*
*A*3. Leaves elliptic-obovate, crenate-serrate, large. Flowers large. *macrantha.*
*A*4. Leaves mostly obovate.
  b. Flowers terminal, solitary. Glabrous shrub. *berberidifolia.*
  *b*2. Flowers terminal, in 2–7-flowered racemes, red. *rubra.*
  *b*3. Flowers in terminal panicles, pink. Branches pubescent. *littoralis.*
  *b*4. Flowers few in panicles; pedicels and calyx glandular, red. *rahmeri obovata.*
  *b*5. Flowers crowded on branchlets. Glabrous shrub. *carmelita.*

1. ESCALLONIA ALPINA Poepp. & Endl.

Undershrub. Branches glabrous. *Leaves* linear-sublanceolate, acuminate both ways, rarely serrate, crowded, 17 by 30 mm. *Flowers* solitary on short pedicels in the upper axils, aggregate to an ovate *raceme*. *Calyx-limb* 5-cleft, sinuses obtuse, lobes acute. *Petals* obovate, with obscure pinnate venation, shortly clawed.

(Mts. of Chili); Patagon.

2. E. BERBERIDIFOLIA H. B. & K.

Glabrous with spreading branches. *Leaves* obovate, rather obtuse, crenulate-toothed, reticulately venous. *Flowers* terminal, solitary. *Calyx-lobes* entire. *Petals* subspatulate.

(Andes of Peru, etc.); S. Patagon., by Lago Argentino; Chubut, in elevated shrubberies.

3. E. CARMELITA Meyen.

Glabrous; profusely branching. *Leaves* obovate-elliptical, subacute, serrulate. *Flowers* crowded in small, flowering branchlets. *Petals* oboval, with long claws.

(Chili); Patagon., Chubut, in mountain shrubberies. Sterile specimens having ends of branches mostly strobilaceously thickened.

4. E. LITTORALIS Phil.

Stem 5 meters tall, branches erect, the younger pubescent. *Leaves* obovate, obtuse or acute, attenuate-petiolate, serrate or subcrenate, resinous-punctate below, or rough on the midrib; 5 cm. long. *Flowers* pink, in terminal panicles. *Pedicels* rough-glandular. *Calyx* dilated, its teeth short. Petals long-clawed.

N. Patagon., near Valdivia.

5. ESCALLONIA MACRANTHA Hook. & Arn.

Small shrub; the root, stem, and branches *glandular-pubescent. Leaves* large, elliptic-ovate, obtuse, basi-cuneate, crenate-serrate. *Flowers* large. *Calyx-lobes* subulate.

S. Chili to Chonos Archip.

6. E. PTEROCLADON Hook.

Branches high, sinuate-winged, the wings ciliate. *Leaves* small, coriaceous, glabrous, short-petioled, lanceolate-serrulate. *Flowers* nodding, in the axils of leaves, forming secund, leafy spikelike *racemes.* Pedicels short, bracteolate. *Calyx-segments* triangular-subulate. Claws of *petals* forming a tube.

Patagon.

7. E. RAHMERI Phil.

Innovation-branches scarcely puberulous, but *glandular-rough. Leaves* ovate, petiolate, equally acuminate both ways, very serrate and biserrate, basally entire; resinous punctate underneath. *Panicles* few-flowered; pedicels and calyx very glandular; *calyx-teeth* narrow, elongate; *petals* oblong-spatulate, red.

(Chili, Araucania.)

E. RAHMERI OBOVATA Speg.

Leaves mostly obovate and smaller than in the type.

Chubut, in mountain shrubberies.

8. E. ROSEA Gris.

Shrub, 2–3 m. high. Branches glabrous, the younger angular, rufous, spreading, densely leafy. *Leaves* small, subcoriaceous, glabrous, paler and veiny underneath, short-petiolate, spatulate-lanceolate, serrulate. *Flowers* solitary in the axils of the uppermost leaves, in a simple *raceme.* Pedicels shorter than the calyx, with setaceous *bracteoles. Petals* linear-spatulate, 6 times as long as the calyx-limb; their *claws* forming a tube.

S. Patagon., valley of Rio Gallegos (Nordenskj.).

9. ESCALLONIA RUBRA Pers.

Glabrous; branches erect, the younger glandular-villous. *Leaves* obovate-oblong, acuminate, serrate, resin-dotted underneath. *Peduncles* 2–7-flowered, terminal, bracted. *Calyx-lobes* toothed. *Petals* spatulate, red, only their tips spreading. (Fig. in Engl. & Prantl, iii. 2a, p. 84.)

(Chili; Argentina); Chubut (Speg.); S. and W. Patagon. (C. Reiche and F. Philippi, *Flora de Chile*, III., include in *E. rubra* Pers. 5 Chilian forms which have been described as separate species, viz., *uniflora*, *poeppigiana*, *multiflora*, *albiflora*, *glutinosa*.)

10. E. SERRATA Smith.

Small glabrous shrub, with clustered *leaves*, which are obovate or spatulate, obtuse, serrate, veinless below, except the midrib. *Flowers* solitary, terminal; *calyx-lobes* triangular-acute. *Petals* oblong, linguæform.

Patagon., E. and W. Magell., to Cape Horn.

11. E. ULIGINOSA Phil. (O. Ktze. sub *Cynoglossum*).

Rather glabrous. *Stems* elongate, procumbent, branching. *Leaves* linear, sparsely appressed-setulose. *Racemes* elongate. *Pedicels* at length equalling the hispid calyx. *Corolla* milky, 6 mm. diam.

(Chili, Colchagua.)

12. E. VIRGATA Pers. (*E. stricta* Rem.)

Leaves obovate-spatulate, serrulate. *Peduncles* subterminal, 1-flowered. *Calyx* toothed, the teeth acute, marginally glandular. *Petals* obovate. The *older branches*, becoming defoliated, resemble spines.

(Chili); S. Patagon., by Lago Argentino; Cordillera; Chubut, in mountain shrubberies.

7. RIBES Linn. Gooseberry, Currant.

Shrubs, with alternate, lobed *leaves*, and 4–5-merous *flowers*, the *petals* and 4–5 *stamens* perigynous. *Ovary* 1-celled, becoming a *berry*, crowned by the *persistent calyx*. *Styles* 2, these sometimes branched.

Species 60, from Himalaya by E. Asia and Siberia to W. Amer., and by the Andes to Patagon. Not native in Australasia.

1. RIBES CUCULLATUM Hook. & Arn.

Unarmed, with glabrous branches. *Leaves* glabrous, about 5-lobed, round-reniform, cuneate and cucullate at base, the lobes mutually incumbent, acutely incised-lobate. *Petiole* nearly as long as the leaf. *Raceme* scarcely puberulous, axillary, short, few-flowered. *Flowers* subsessile, scarcely exceeding the roundish *bracts.*

(Chili); W. Patagonia, by Rio Aysen (Dusén); S. Patagon.

2. R. EBRACTEOLATUM Spach. (*R. alpinoides* Domb.)

Leaves ovate to ovate-oblong or subrotund, coarsely crenate-serrate or dentate, deeply 3-lobed, basitruncate or cuneate, or subcordate. *Racemes* (sterile) 3–5 cm. long, rather lax; *pedicels* very short, ebracteolate. *Calyx-lobes* half as long as the tube. *Style* subsimple.

Erect shrub, nearly 2 meters high. *Peduncles* 3 cm. long, with pubescent rachis. *Bracts* 6–8 mm. long, the lower exceeding the flowers; but no *bracteoles* on the pedicels.

Patagon.

3. R. GLANDULOSUM Ruiz & Pav.

Leaves cordate, obtusely 3-lobed, biserrate, rugose. *Racemes* short. *Calyx* glandular-pubescent.

(Andine region); Chubut, in mountain shrubberies.

4. R. LACARENSE Phil.

Leaves with suborbicular laminæ (8–9 mm. across), subcuneate, 3-nerved or trifid, the lobes obovate, 3-toothed, petioles 4–5 mm. long. *Peduncles* mostly 3-flowered. *Bracts* ovate, orbicular, obtuse, glabrous. *Flowers* sessile, small, glabrous. Sepals acute, pink. Berries purple.

Near Lago Blanco, Chubut.

5. R. MAGELLANICUM Poir.

Unarmed, puberulous. *Leaves* ovate, or broad-ovate-rotundate, truncate at base or cordate, 3-lobed, coarsely biserrate, the younger grandular, the older smooth, save the nerves underneath. *Racemes* many-flowered, at first pendulous, elongate and usually erect in fruit. Pedicels short; *bracts* ligulate, as long as the flowers. *Calyx-lobes* obtuse. *Petals* small, reflexed at apex. *Berries* red, agreeable. ("Fruit black," Speg.)

Patagon., by Lago Nahuel-huapi; Punta Arenas (J. B. Hatcher); over all Fuegia to Cape Horn. In Chubut a *variety* with smaller *leaves*, subhastate triangular. (Speg.)

Family 50. CUNONIACEÆ.

Shrubs or trees, with opposite or whorled stipulate *leaves* and *small flowers* in heads or racemes; the *flowers* mostly perfect, with a hypogynous *disk*, and 5- rarely 4-merous *calyx* and *corolla; stamens* mostly twice as many and perigynous, on a disk. *Carpels* few, mostly 2. *Fruit* usually a 2-lobed capsule. *Seeds* numerous, in 2 ranks, sometimes hairy or winged. *Embryo* small, in large endosperm.

Species 120, chiefly in the Southern hemisphere. *Weinmannia* and its relatives, having woolly seeds which are carried in birds' feathers, are widely dispersed in places south of the equator. The others are confined to a narrow region; as New Caledonia, and E. Australia. The Brazilian genus *Belangera* is closely allied to the Malay-Caledonian *Geissois* (Engler). In this last case the migration must have been toward Brazil.

PATAGONIAN GENERA.

Low trees with small white flowers.
a. Racemose. Calyx-lobes imbricate. Seeds hairy. Leaves odd-pinnate. 1. *Weinmannia.*
aa. Panicled. Calyx-lobes valvate. Seed-coat membranaceous. Leaves simple. 2. *Caldcluvia.*

1. WEINMANNIA Linn. (1759). (*Windmannia* P. Br., 1756.)

Leaves opposite, coriaceous, petiolate, simple or trifoliolate, or pinnate, with the leaflets glandular-serrate, and the rachis often winged. *Stipules* deciduous. Simple *racemes* of small, white flowers, hermaphrodite or polygamo-diœcious. *Calyx-tube* short, its lobes imbricate. *Seeds* mostly with hairs, sometimes woolly.

Species 70, trop. and subtrop., of S. Amer., with solitary species in Austral., N. Zeal., the Mascarene and Pacific Is.

W. TRICHOSPERMA Cav.

A low tree, with odd-pinnate *leaves*; leaflets 5–6 pairs, oblong-serrate; rachis with semirhomboid *wings*. *Stipules* ovate, deciduous. *Racemes*

EXPLANATION OF PLATE IV.

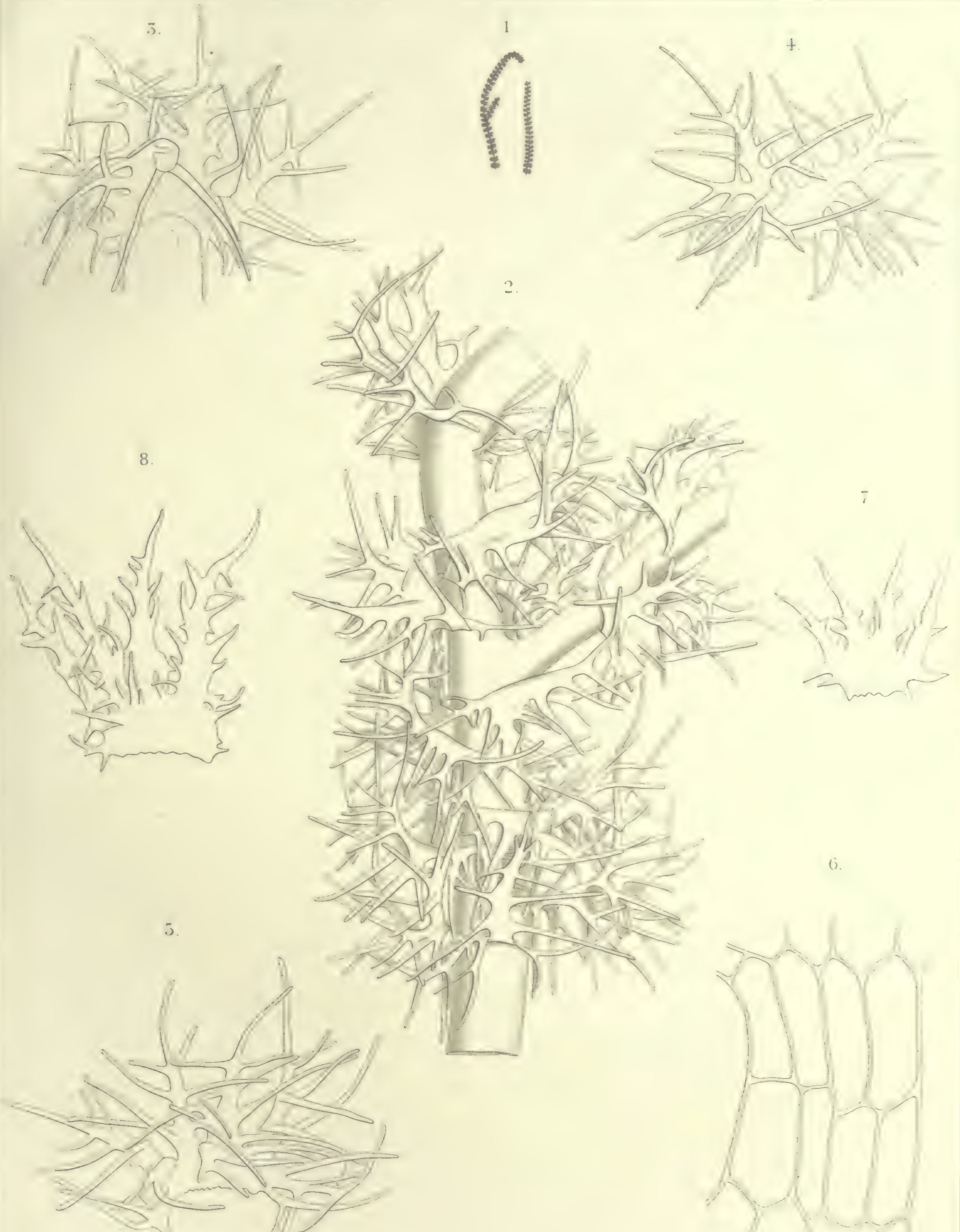
PAGE

BLEPHAROSTOMA PILOSUM Evans 45

Fig. 1. Plants (× $\frac{3}{2}$).
Fig. 2. Part of stem, antical view (× 50).
Fig. 3. Leaf (× 50).
Fig. 4. Leaf subtending branch (× 50).
Fig. 5. Underleaf (× 50).
Fig. 6. Cells from middle of leaf (× 440).

BLEPHAROSTOMA QUADRIPARTITUM (Hook.) Trevis 46

Fig. 7. Leaf (× 50).
Fig. 8. Perichætial bract (× 50).



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EXPLANATION OF PLATE V.

PAGE

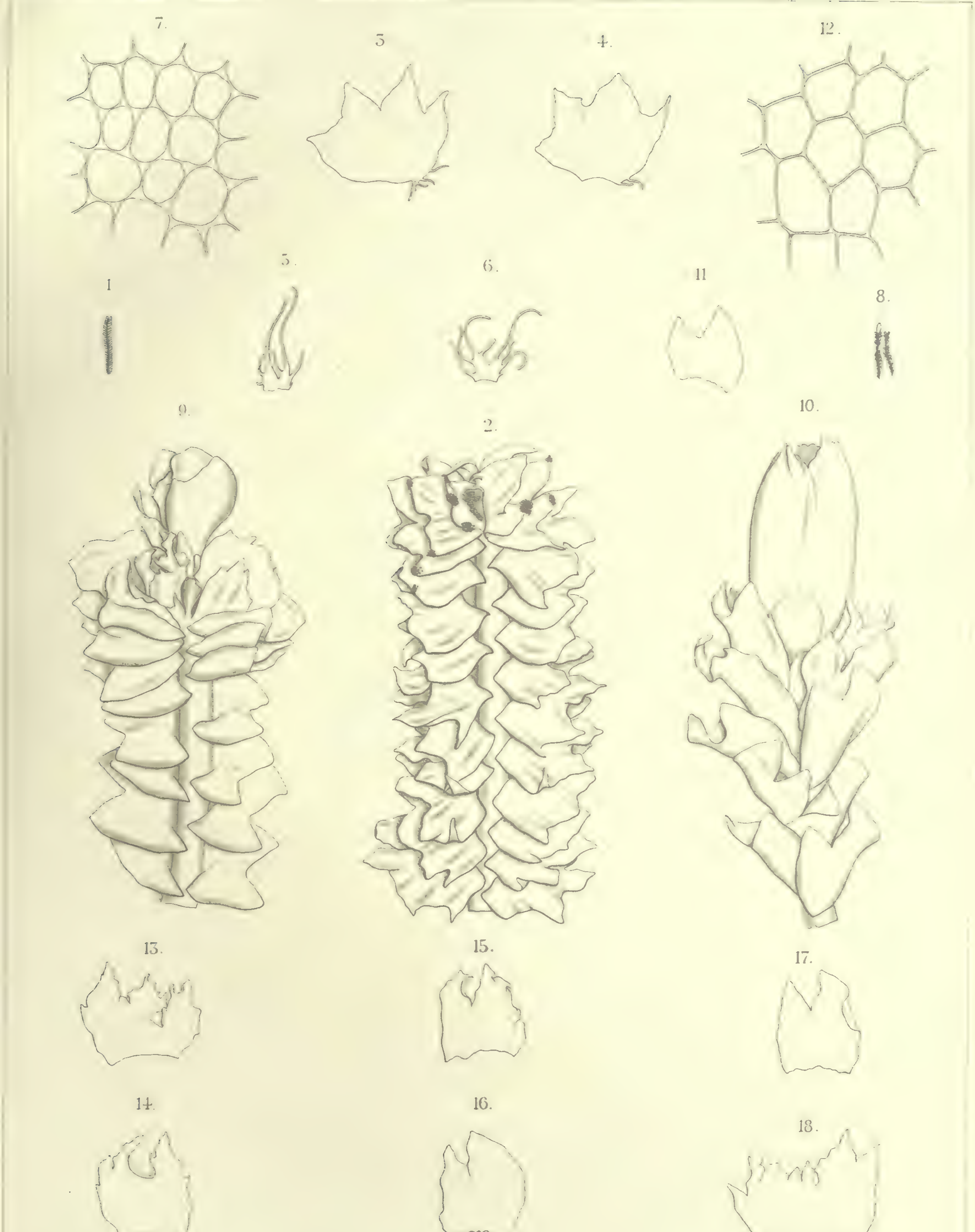
JUNGERMANNIA HATCHERI Evans 45

Fig. 1. Plant (× $\frac{4}{3}$).
Fig. 2. Part of gemmiparous stem, antical view (× 20).
Figs. 3, 4. Leaves (× 16).
Figs. 5, 6. Underleaves (× 28).
Fig. 7. Cells from middle of leaf (× 250).

JUNGERMANNIA PROPAGULIFERA Gottsche 46

Fig. 8. Plants, natural size.
Fig. 9. Part of stem with male and female inflorescence, antical view (× 20).
Fig. 10. Part of stem, with perianth, antical view (× 16).
Fig. 11. Leaf (× 20).
Fig. 12. Cells from middle of leaf (× 250).
Figs. 13, 14. Innermost perichætial bracts, 13 with connate bracteole (× 16).
Fig. 15. Bract of next outer row (× 16).
Figs. 16, 17. Perigonial bracts (× 16): 13–17 from one inflorescence.
Fig. 18. Innermost perichætial bracts with connate bracteole between them, from another inflorescence (× 16).

PLATE V.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EXPLANATION OF PLATE VI.

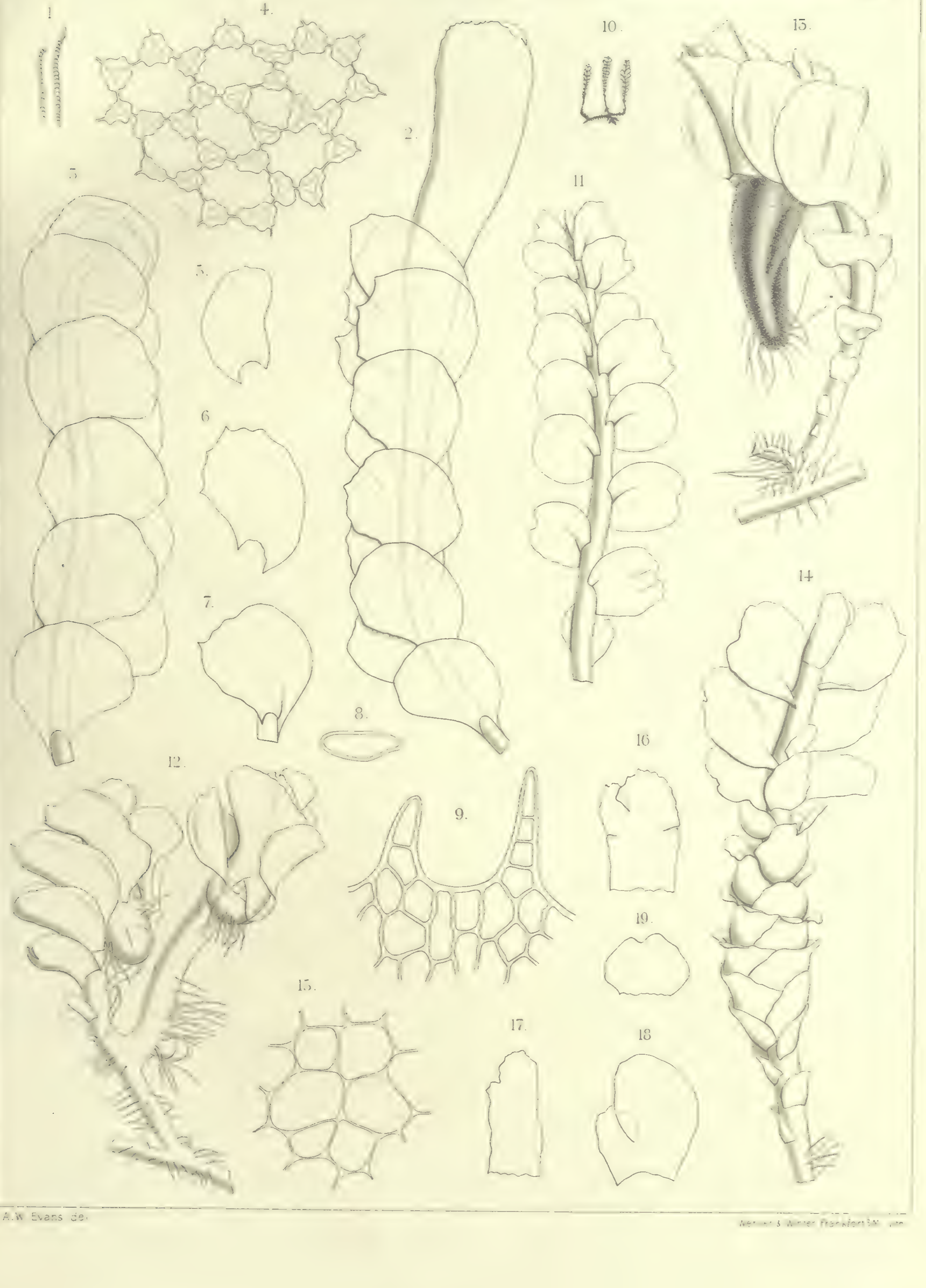
	PAGE
Plagiochila ansata Hook. f. & Tayl.	54

Fig. 1. Plants, natural size.
Fig. 2. Part of stem, with perianth, lateral view (× 15).
Fig. 3. Part of sterile stem, lateral view (× 15).
Fig. 4. Cells from middle of leaf (× 290).
Figs. 5, 6, 7. Bracts, in regular order from perianth (× 15).
Fig. 8. Transverse section of perianth (× 18).
Fig. 9. Teeth from mouth of perianth (× 290).

Tylimanthus anderssonii (Ångstr.) Evans.	56

Fig. 10. Plants, natural size.
Fig. 11. Sterile stem, postical view (× 12).
Fig. 12. Female stem with two young sacs (× 12).
Fig. 13. Female stem, with mature sac (× 12).
Fig. 14. Male stem, antical view (× 12).
Fig. 15. Cells from middle of leaf (× 220).
Figs. 16, 17, 18. Perichætial bracts (× 12).
Fig. 19. Perigonial bract (× 14).

PATAGONIAN EXPEDITIONS VOL. VIII. PLATE VI.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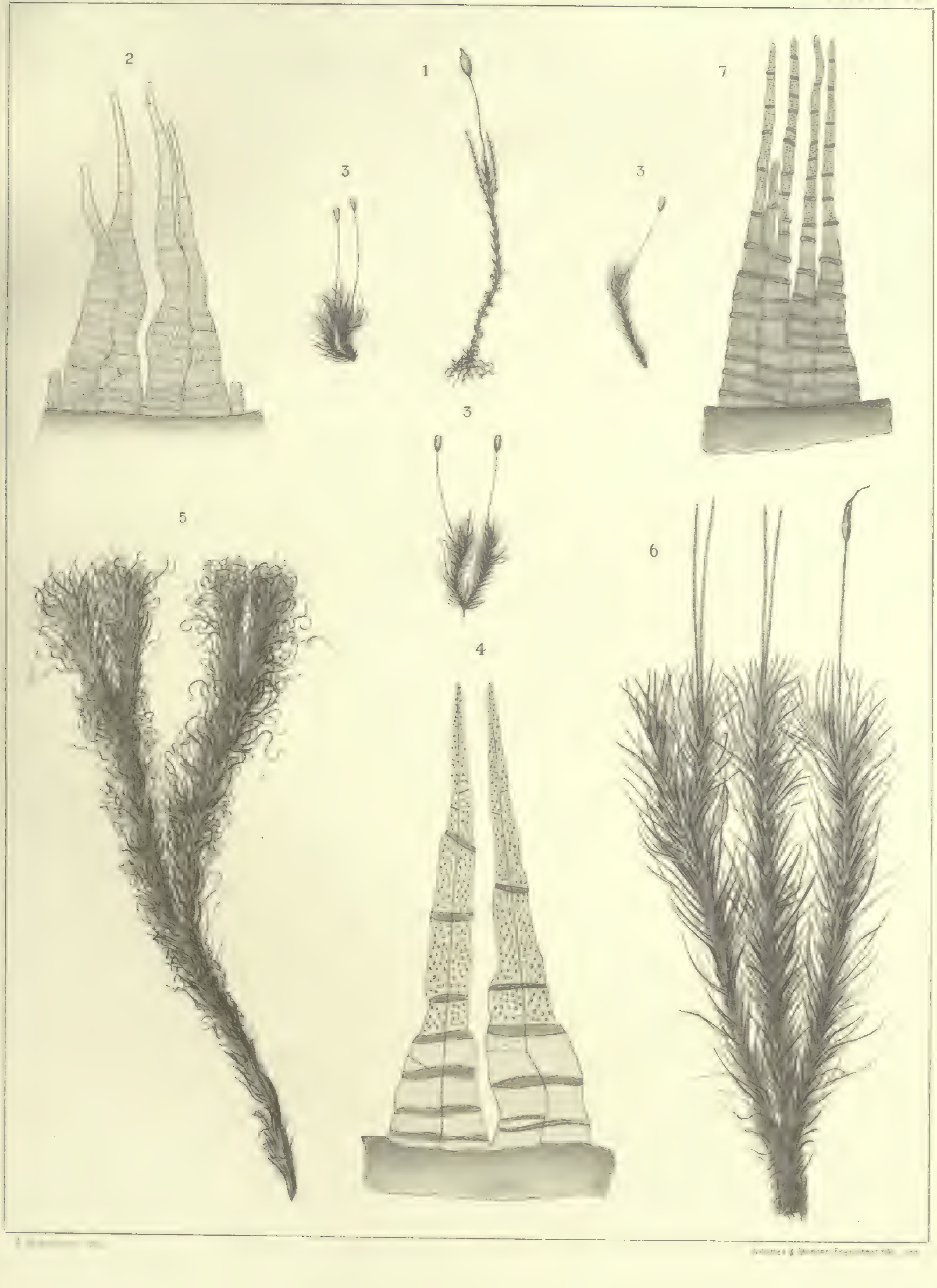
EXPLANATION OF PLATE VII.

	PAGE
ANISOTHECIUM PERPUSILLUM Dusén, n. s.	66
Fig. 1. Planta (× 2).	
Fig. 2. Dentes peristomii (defectivi) (× 175).	
DICRANOWEISIA PERPULVINATA Dusén, n. s.	67
Fig. 3. Planta (× 2).	
Fig. 4. Pars peristomii (× 250).	
DICRANUM CIRRHIFOLIUM Schpr.	69
Fig. 5. Planta siccitate, mag. nat.	
Fig. 6. Planta humiditate, mag. nat.	
Fig. 7. Pars peristomii (× 175).	

PLATE VII



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EXPLANATION OF PLATE VIII.

PAGE

Dicranum scaberrimum Dusén. 70
Fig. 1. Planta, mag. nat.

Dicranum dicranellatum Dusén, n. s. 74
Fig. 2. Plantæ, mag. nat.
Fig. 3. Dentes peristomii (× 175).

Barbula perrubiginosa Dusén, n. s. 75
Fig. 4. Planta, mag. nat.

Grimmia fallax Dusén. 77
Fig. 5. Plantæ (× 2).
Fig. 6. Pars peristomii (× 125).

Grimmia macropulvinata Dusén, n. s. 78
Fig. 7. Plantæ (× 4).

Orthotrichum macloskii Dusén, n. s. 80
Fig. 8. Planta (× 8).
Fig. 9. Pars peristomii (× 200).
Fig. 10. Theca calyptrata juventute (× 18).
Fig. 11. Theca deoperculata siccitate (× 18).

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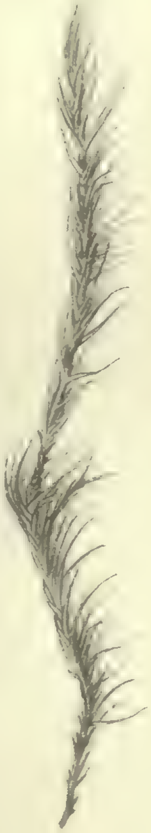

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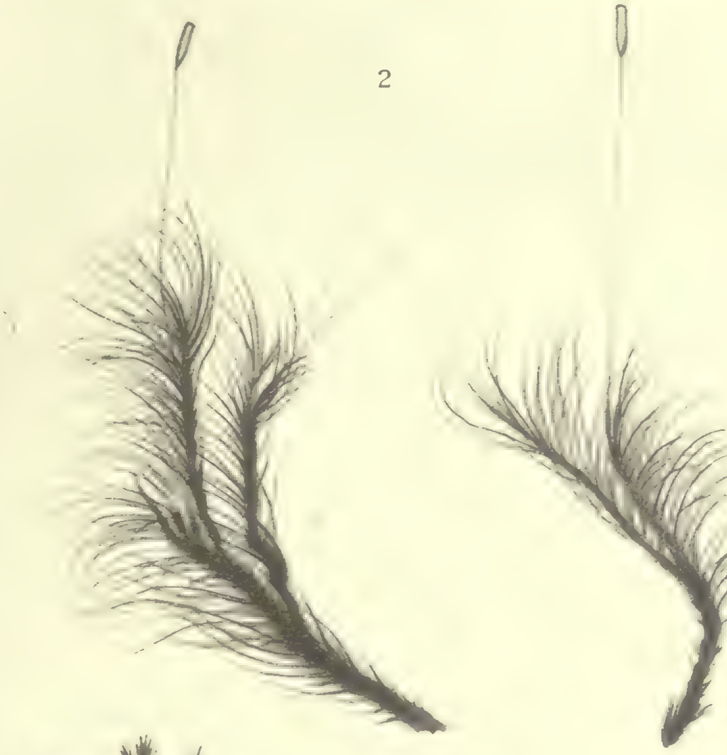

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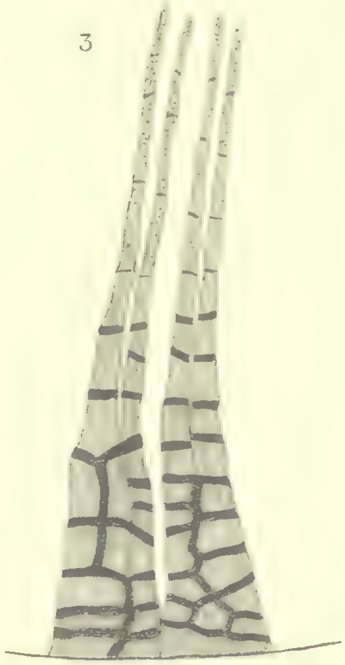

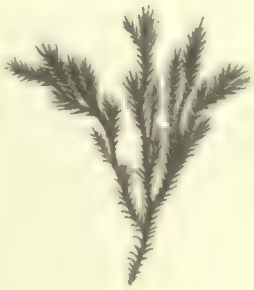

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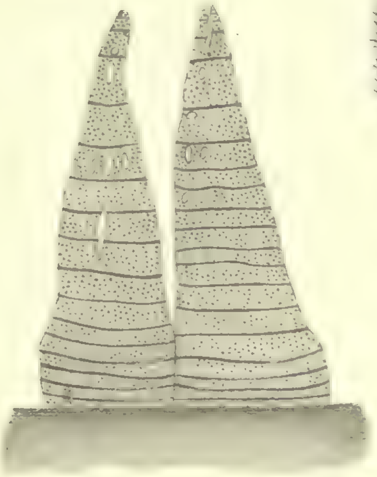

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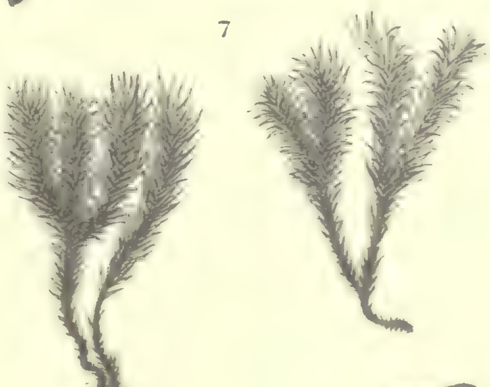

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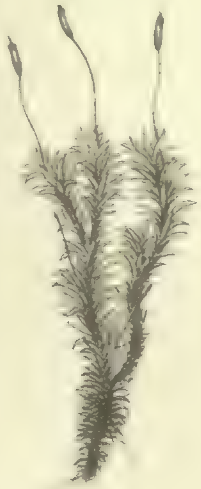

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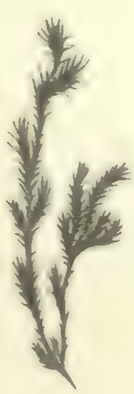

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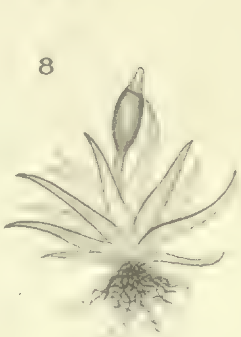

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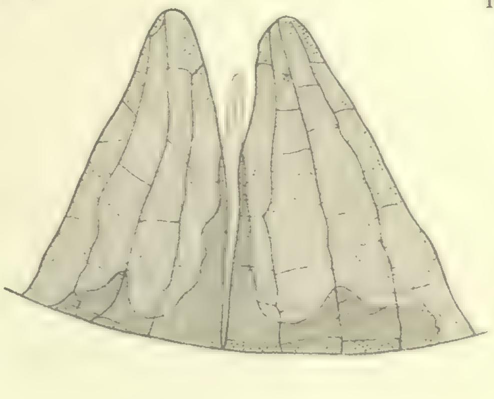

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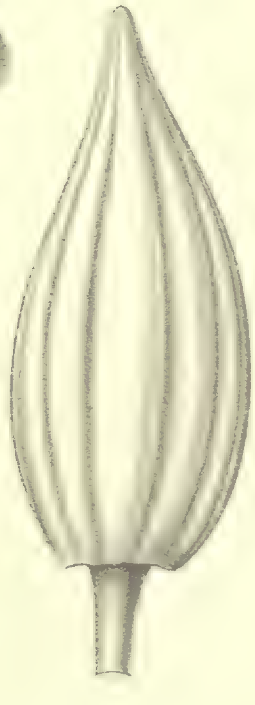

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A. [illegible] del.

Werner & Winter, F[illegible]

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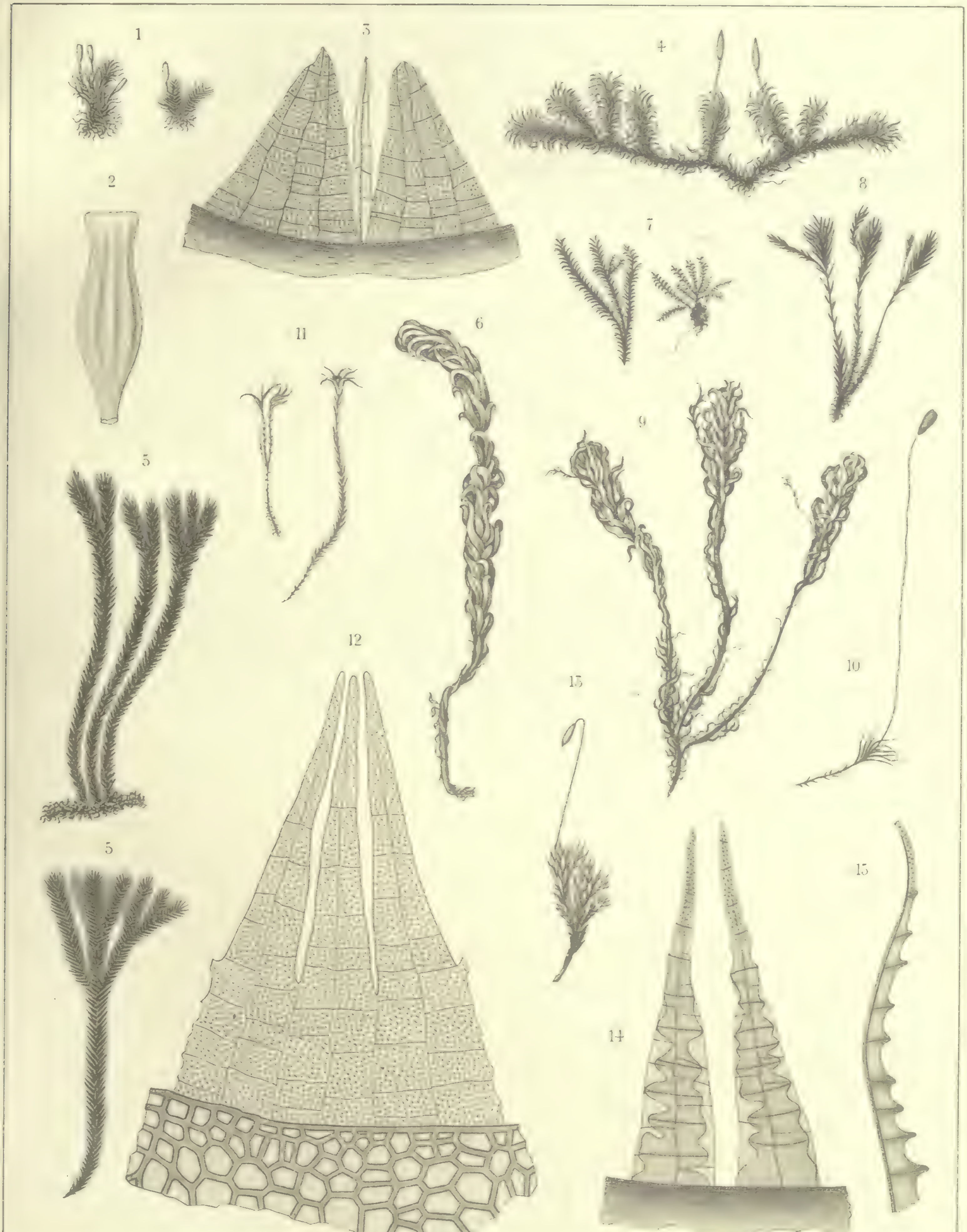
EXPLANATION OF PLATE IX.

	PAGE
ORTHOTRICHUM COMPACTUM Dusen, n. s.	81
Fig. 1. Planta (× 3).	
Fig. 2. Capsula siccitate (× 35).	
Fig. 3. Pars peristomii (× 285).	
ULOTA HAMATA Dusén, n. s.	82
Fig. 4. Planta ($\times \frac{4}{1}$).	
MACROMITRIUM BIFASCICULARE C. Muell.	83
Fig. 5. Plantæ, mag. nat.	
ZYGODON CURVICAULIS Dusén, n. s.	84
Fig. 6. Planta siccitate (× 10).	
Fig. 7. Planta humiditate (× 2).	
ZYGODON HATCHERI Dusén, n. s.	86
Fig. 8. Planta humiditate, mag. nat.	
Fig. 9. Planta siccitate (× 2).	
LEPTOBRYUM POTTIACEUM Dusén, n. s.	87
Fig. 10. Planta fem., mag. nat.	
Fig. 11. Planta masc., mag. nat.	
Fig. 12. Pars peristomii (× 87).	
BRYUM LAMPROCHÆTE Dusén, n. s.	89
Fig. 13. Planta, mag. nat.	
Fig. 14. Pars endostomii (× 175).	
Fig. 15. Dens peristomii a latere visus (× 200).	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EXPLANATION OF PLATE X.

PAGE

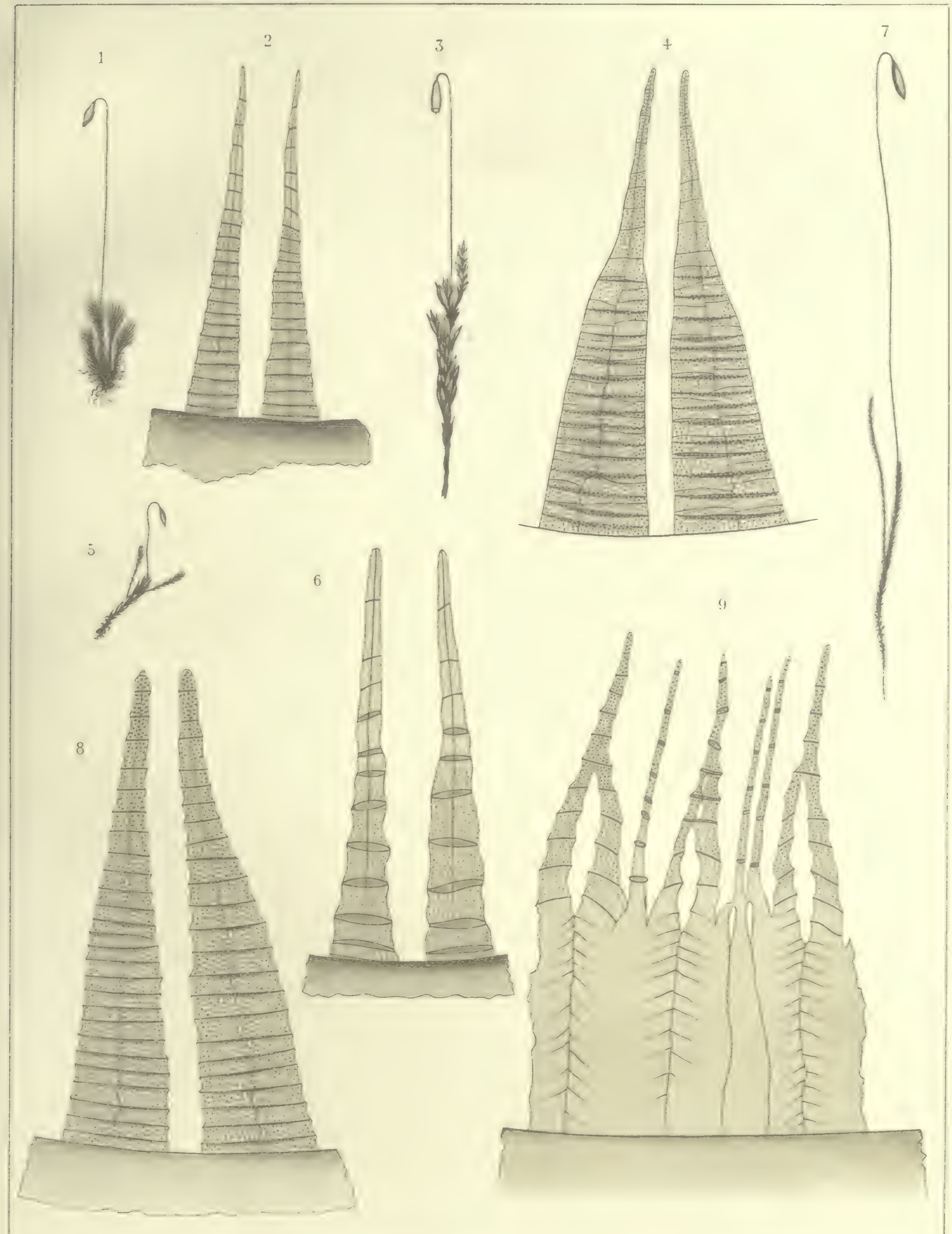
Bryum vernicosum Dusén, n. s. 90
- Fig. 1. Planta, mag. nat.
- Fig. 2. Pars endostomii (× 200).

Bryum rigochæte Dusén, n. s. 91
- Fig. 3. Plata, mag. nat.
- Fig. 4. Pars exostomii (× 285).

Bryum hatcheri Dusén, n. s. 92
- Fig. 5. Planta, mag. nat.
- Fig. 6. Pars exostomii (× 200).

Webera lonchochæte Dusén, n. s. 94
- Fig. 7. Planta, mag. nat.
- Fig. 8. Pars exostomii (× 175).
- Fig. 9. Pars endostomii (× 175).

PLATE X.



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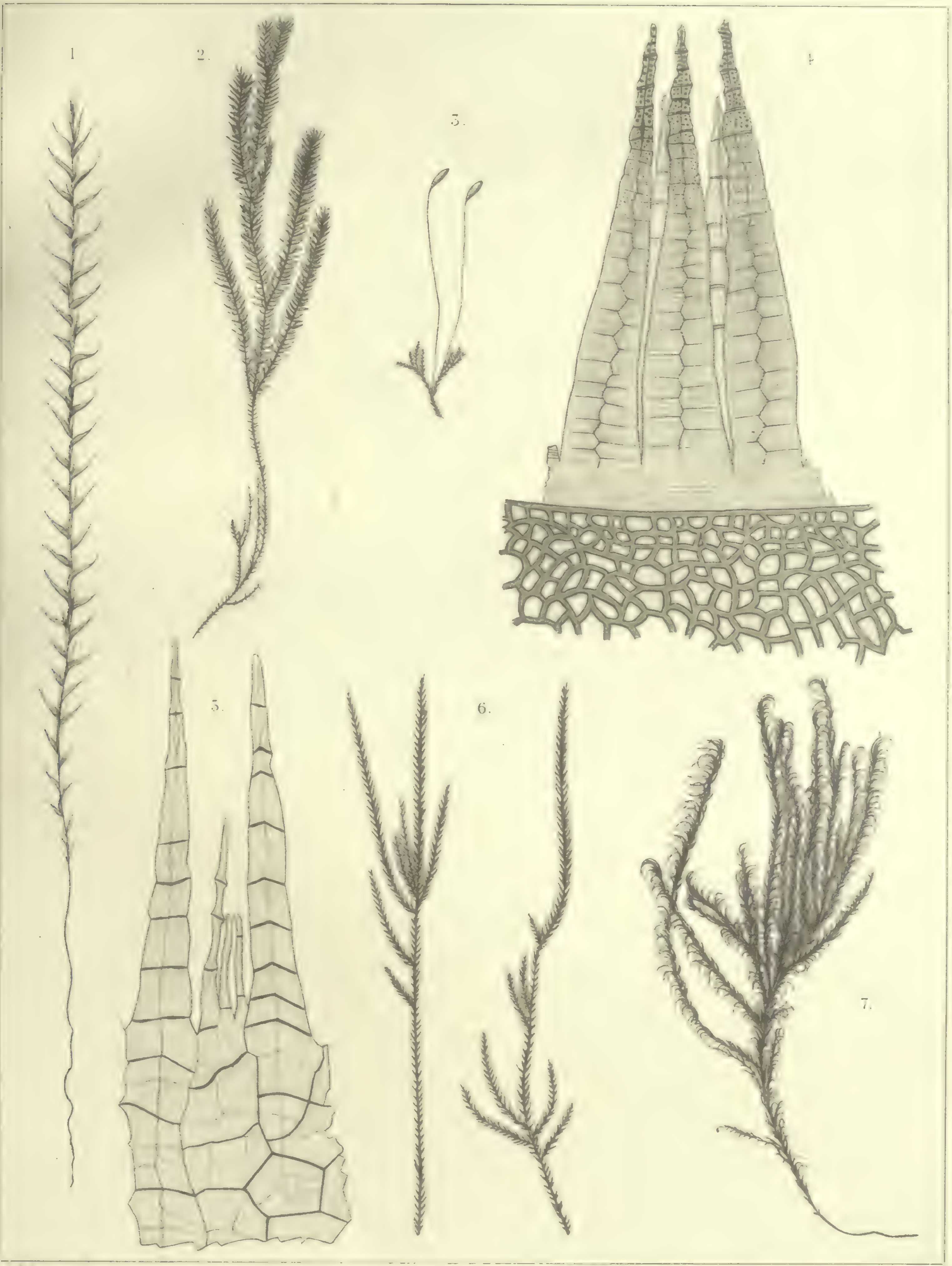
EXPLANATION OF PLATE XI.

	PAGE
Meesia patagonica Dusén, n. s.	95
Fig. 1. Planta (× 3).	
Plagiothecium leptoplumosum Dusén, n. s.	100
Fig. 3. Planta, mag. nat.	
Fig. 4. Pars peristomii (× 125).	
Fig. 5. Pars endostomii (× 175).	
Sciaromium depastum Dusén, n. s.	101
Fig. 2. Planta, mag. nat.	
Sciaromium gracile Dusén, n. s.	102
Fig. 6. Planta, mag. nat.	
Hypnum perplicatum Dusén, n. s.	103
Fig. 7. Planta, mag. nat.	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EXPLANATION OF PLATE XII.

	PAGE
CAREX PATAGONICA Spegazzini	285

The central figure gives the general habit, of natural size.

On the right, above, are two young plants, slightly magnified.

ad, andrecium on the staminal scale.

l, *l*, two young leaves, their sheathing bases and short laminæ.

s, seed (achene) with its 3-branched style. To its left is seen the utricle enclosing the seed.

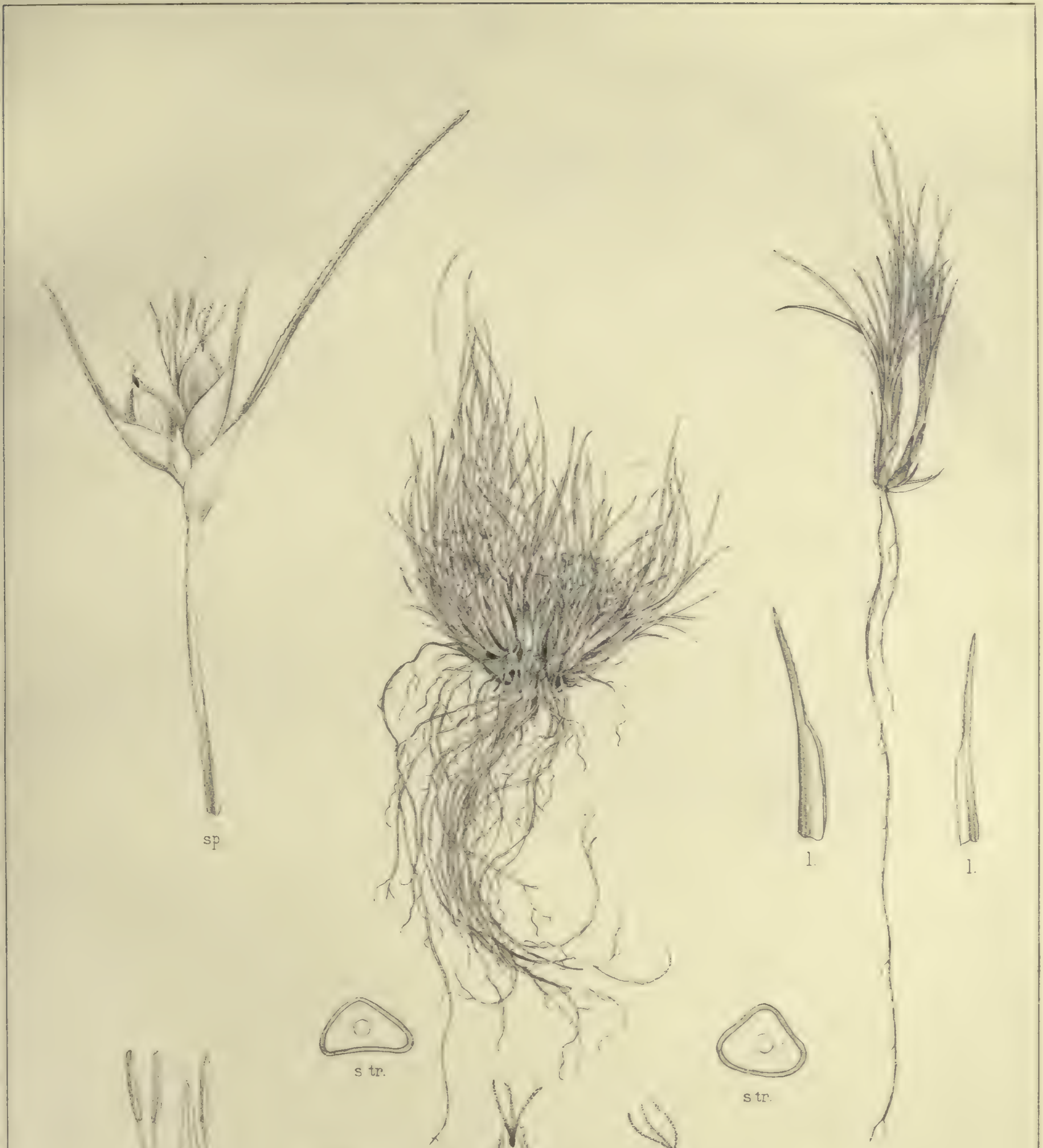
sa, superior aspect of seed (achene).

sp, female spike, with its bracts and scales.

str, *str*, cross-sections of young and maturing seeds.

su, superior aspect of utricle.

Figures *ad–su* are all magnified.


sp
l.
l.
s tr.
s tr.
ad.
s.u.
s
s.a.

F v Iterson del., J N Fitch lith.

West, Newman imp.

CAREX PATAGONICA *(Speg)*

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EXPLANATION OF PLATE XIII.

PAGE

PHILESIA BUXIFOLIA Lamarck 309

The central figure gives the general habit, of natural size.

ad, andrecium, enclosing the apex of the style.

f, fruit.

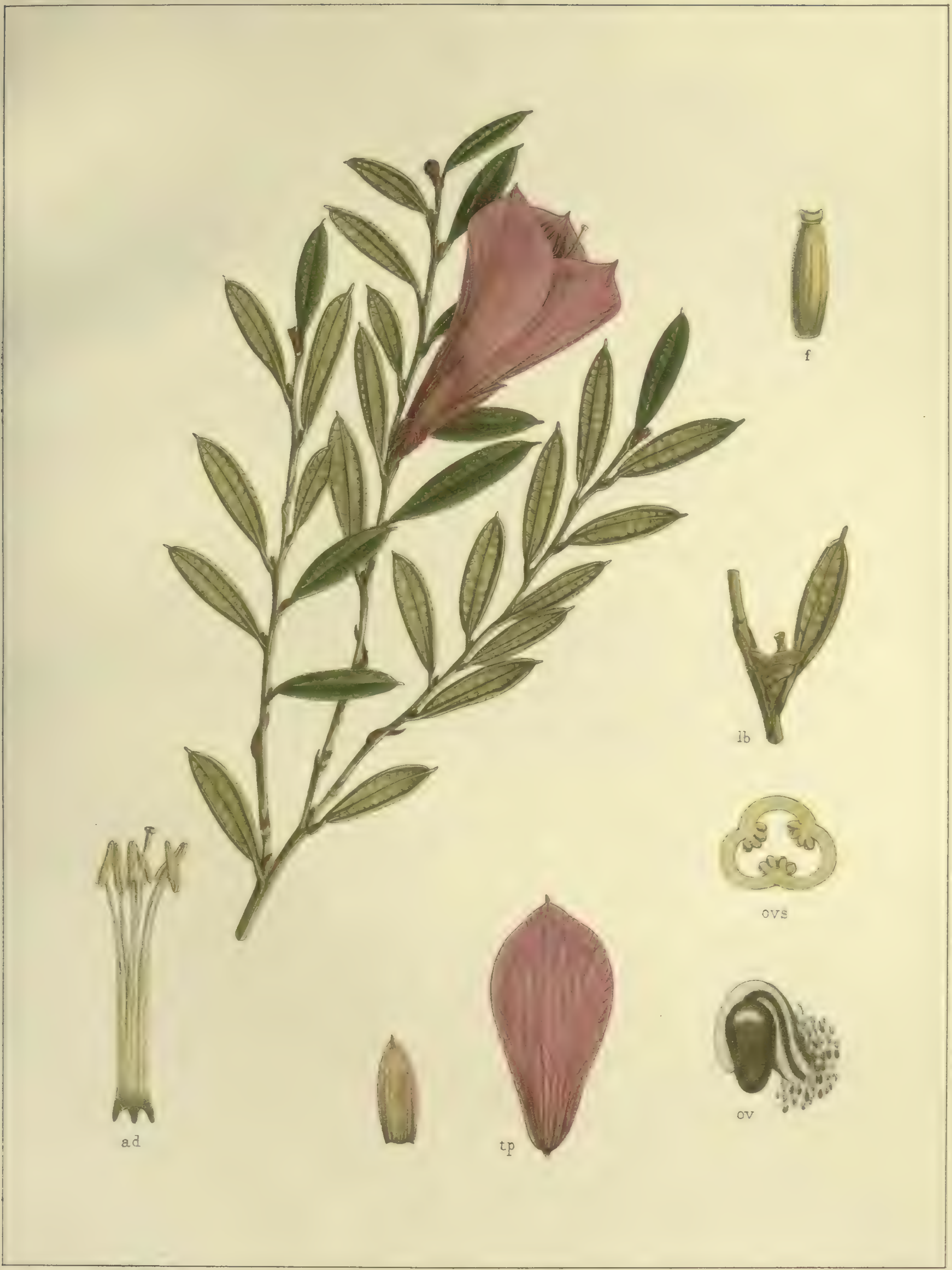
lb, leaf and bracts.

ov, ovule.

ovs, ovary in transverse section.

tp, an inner tepal; beside it is one of the small outer tepals.

(*ov* and *ovs* are slightly magnified.)


f
lb
ovs
ad
tp
ov

F. v. Iterson del., J. N. Fitch lith.
West, Newman imp.

PHILESIA BUXIFOLIA, *Lam.*

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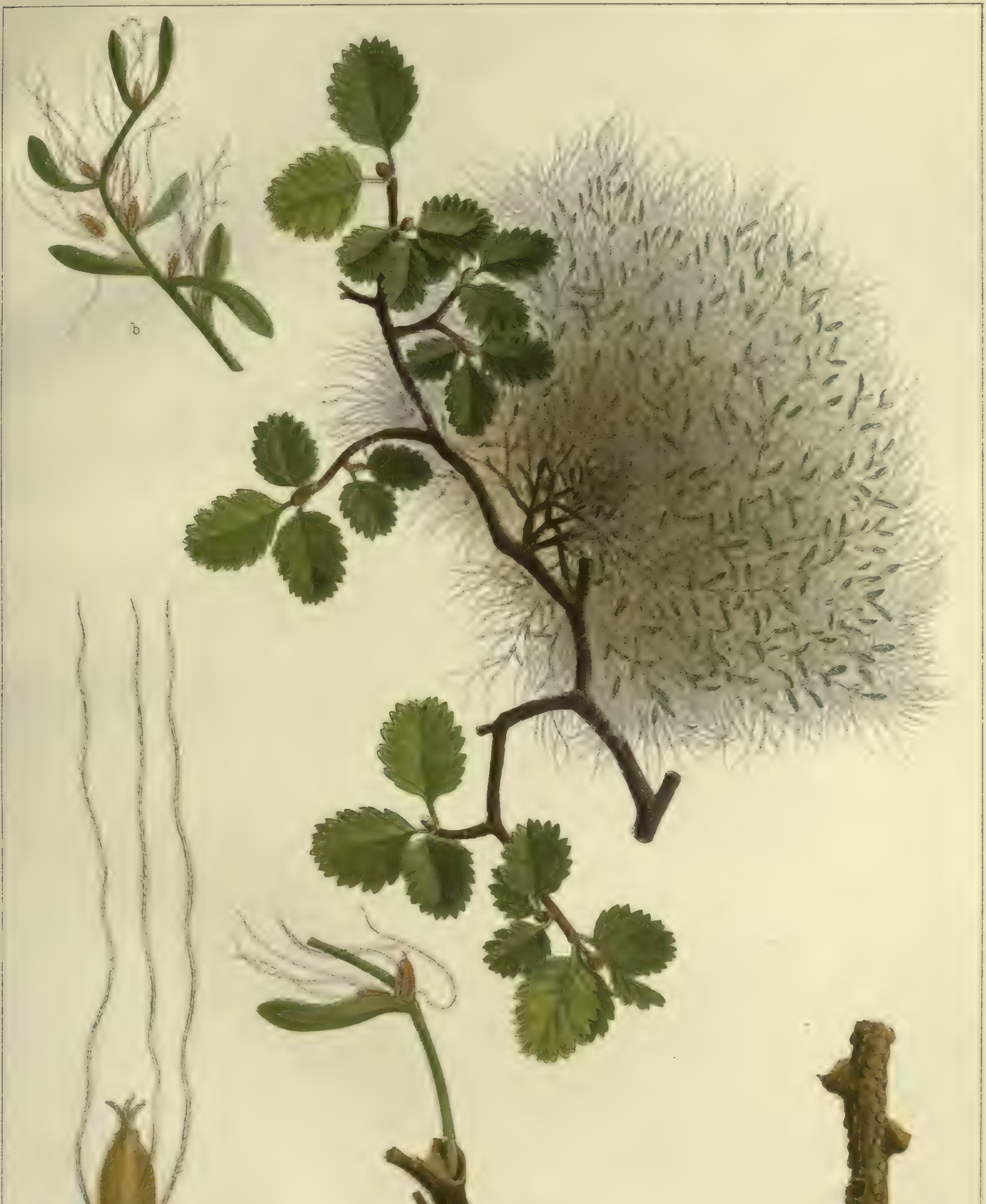
EXPLANATION OF PLATE XIV.

	PAGE
Species of MYZODENDRON	337
General figure shows the fruiting. *Myzodendron brachystachyon* DC., on a branch of the Southern deciduous Beech (*Nothofagus antarctica*, Forst., Blume); of natural size.	
b, a branch of *M. brachystachyon*, slightly magnified.	
f, its fruit, magnified.	
n, one of its nodes, slightly magnified.	
B. Fragment of a branch of *Myzodendron punctulatum* (Banks) Sol. .	338



F v. Iterson del., J.N Fitch lith
West, Newman imp.

MYZODENDRON BRACHYSTACHYUM, *D.C.*, on Nothofagus antarctica *(Forst.)*
B, branch of M. punctulatum, *B & S.*

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